

SPECIFICATION

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN THAT WE, KIYOHARU NISHIYAMA, a citizen of Japan residing at Saitama, Japan and KUNIKAZU TSUDA, a citizen of Japan residing at Kanagawa, Japan have invented certain new and useful improvements in

MULTI-MEDIA DATA AUTOMATIC DELIVERY SYSTEM

of which the following is a specification:-

1 BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention generally relates to a system including a center system, terminal systems,
5 and communication lines for the purpose of delivering and displaying contents, and particularly relates to a multi-media-automatic-delivery system in which data of moving-picture contents such as commercial advertisement is transmitted from a center system to a
10 plurality of terminal systems via communication lines so as to display the contents on screens of the terminal systems.

2. Description of the Related Art

Surface-radio broadcasting, satellite
15 broadcasting, and cable broadcasting are widely used to simultaneously send the identical information to general audience residing in a wide range of areas.

When information of a local nature such as local commercials or local weather information needs
20 to be delivered to a particular local area, however, restricting the areas of delivery is rather a difficult task.

In recent years, cable television, which is directed to providing service to a local area, has
25 made a certain progress in market. Installation,

1 however, is required in advance with respect to
dedicated adaptors, cables, and the like. Further,
cable television also has a difficult technological
challenge to overcome in order to deliver information
5 to a selected area within the area of service.

 An effort to overcome these problems in the
related art has resulted in certain schemes. An
example of such schemes is found in a Japanese Laid-
open Patent Application No.10-4379 (title of the
10 invention: Advertisement Device, Date of Filing:
6/14/1996). This scheme is hereinafter called a first
related-art scheme.

 Fig.16 is an illustrative drawing showing a
configuration of the first related-art scheme.

15 The first related-art scheme includes a
center 102A having a host 10A connected to a PHS
terminal. This scheme further includes transit
antennas 101A used for communications between the
center 102A and a public telephone network, and
20 advertisement devices 30A establishing connection with
the public telephone network via the transit antennas
101A.

 In this hardware configuration, information
is delivered from the host 10A to the advertisement
25 devices 30A based on telephone numbers of the

1 advertisement devices 30A, and intervals of the
delivery may be, or may not be, constant. The
delivered information is displayed or output as audio
information in an order of receipt of data (i.e., in
5 an order of received records of the delivered data).
Once all the delivered information is displayed or
output as audio, the same operation is repeated by
going back to the beginning of the data until next
information arrives from the host 10A.

10 The advertisement devices of the first
related-art scheme are supposed to be able to provide
a diligent advertisement service at a low cost by use
of the PHS terminal 20A and the public telephone
network.

15 These advertisement devices may be installed
at convenient stores or super markets where POS
registers are located. In such locations,
advertisement of sales goods, notices from a local
community, traffic information, a local weather
20 forecast, or the like can be provided in a
sophisticated manner at a low cost. These features
are disclosed in the above-identified document.

Another example of the schemes directed to
overcoming the related-art shortcomings is use of
25 recording media such as magneto-optical memory medium

1 (e.g., MO disk) and magnetic disks (hard-drive disks).
In this scheme, data is recorded in memory media at
the host 10A, and, then, the memory media are
delivered to client places where the advertisement
5 devices 30A are located. The memory media are loaded
to reading devices of the advertisement devices 30A so
that the advertisement devices 30A can read the data
delivered in the form of recording media. This scheme
is hereinafter referred to as a second related-art
10 scheme.

In the first related-art scheme, the load on
the advertisement devices 30A is relatively light when
a relatively small amount of data such as still-image
information or character information is sent to the
15 advertisement devices 30A. In such a case, a high
performance is not an absolute requirement for the
advertisement devices 30A.

In some cases, however, moving-picture
information or high-definition images having a large
20 amount of multi-media data in the range of several
hundreds mega-bytes may need to be transmitted from
the host 10A to the advertisement devices 30A when
commercials on sales goods, notices from a local
community, traffic information, a local weather
25 forecast, or the like is to be delivered. In such

1 cases, a transmission time for the delivery of
information becomes unduly lengthy, resulting in an
exorbitant fee being required for a lengthy use of the
communication network.

5 In detail, 500-Mbit data, which corresponds
to one minute's worth of MPEG2 video contents
comprised of moving pictures and high-definition
images, may be transmitted from the PHS terminal at a
data rate of 32 kbs. In this case, even if the
10 advertisement devices run almost at their full
capacity, it will take at least 4 hours and 20 minutes
to complete the data transmission.

In the first related-art scheme, when
moving-picture information or high-definition images
15 having a large amount of multi-media data in the range
of several hundreds mega-bytes is to be transmitted
from the host 10A to the advertisement devices 30A for
the purpose of delivering commercials on sales goods,
notices from a local community, traffic information, a
20 local weather forecast, or the like, the load on the
advertisement devices 30A is quite heavy, resulting in
a need for high performance devices. Also, the
communication network is required to have a high data-
transfer capacity. Enhancing the speed of the
25 advertisement devices 30A leads to a cost increase,

1 and use of a high-speed communication network means an
increase in a communication-line-usage fee. Because
of this, it is difficult to adapt the first related-
art scheme to multi-media applications which employs
5 moving pictures and high-definition images.

 In the second related-art scheme, data is
recorded in memory media such as magneto-optical
recording media or magnetic disks (hard-drive disks)
at the site of the host 10A, and the memory media are
10 delivered to client places where the advertisement
devices 30A are located. The memory media are loaded
to reading devices of the advertisement devices 30A so
that the advertisement devices 30A can read the data
delivered in the form of recording media. This
15 configuration requires excessive time and labor, which
are spent on recording and reading of the data as well
as delivery of the memory media.

 Moreover, the first and second related-art
schemes do not provide the host 10A with a function of
20 remote monitoring to monitor operation conditions of
the advertisement devices 30A. This configuration
makes it difficult for the transmission side to check
whether the advertisement devices 30A are actually
displaying the delivered data.

25 In the first and second related-art schemes,

1 the host 10A is not provided with a function of remote
control for controlling operations of the
advertisement devices 30A. Because of this, it is
difficult to check operations of the advertisement
5 devices 30A individually with an aim of providing
diligent delivery control, remote diagnosis, remote
maintenance, etc.

Further, the first and second related-art
schemes do not have a function to control a schedule
10 regarding displaying of delivered data. This makes it
difficult to customize the contents of the delivered
data in accordance with such particulars as seasons,
date, day, and locations where the advertisement
devices 30A are installed.

15 Since the first and second related-art
schemes do not provide a function to control a
schedule regarding displaying of delivered data, it is
difficult to give priority to delivered data of an
urgent nature such as earthquake information, a
20 railway accident, etc., over other delivered data.

The present invention is aimed at addressing
the shortcomings described above.

First, there is a need for a scheme
providing a light-load-time-period-remote-casting
25 function which delivers contents during a nighttime

1 when a communication fee is relatively inexpensive for
the purpose of avoiding a daytime delivery because
such daytime delivery would lead to an increase in a
communication-line-usage fee as it takes a lengthy
5 time to deliver a large amount of contents such as
moving-picture information or high-definition images
having a large amount of multi-media data in the range
of several hundreds mega-bytes, which may need to be
delivered from the center system to a plurality of
10 terminal systems with an aim of delivering commercials
on sales goods, notices from a local community,
traffic information, a local weather forecast, or the
like.

 In detail, 500-Mbit data, which corresponds
15 to one minute's worth of MPEG2 video contents
comprised of moving pictures and high-definition
images, may be transmitted from the PHS terminal at a
data rate of 64 kbs by use of a public telephone
network such as the ISDN. In this case, the light-
20 load-time-remote-casting function of the present
invention is supposed to complete the data delivery
within only one hour or two.

 Second, there is a need for a scheme
providing a light-load-time-period-remote-casting
25 function which delivers contents during a nighttime

1 when terminal systems are idling, the purpose being
not to require the terminal systems to have a high-
performance capacity and not to require the
communication network to have a high-speed-data-
5 transfer capacity so as to avoid a cost increase
associated with enhancement of the terminal systems
and to avoid an increase in a communication-line-usage
fee caused by use of a high-speed-data-transfer
network even when moving-picture information or high-
10 definition images having a large amount of multi-media
data in the range of several hundreds mega-bytes is
delivered from the center system to a plurality of
terminal systems with an aim of delivering commercials
on sales goods, notices from a local community,
15 traffic information, a local weather forecast, or the
like.

Third, there is a need for a scheme
providing a light-load-time-period-remote-casting
function which allows the transmission side to check
20 whether delivered contents are actually displayed on
terminal systems by using a remote monitoring function
to monitor operations of the terminal systems.

Fourth, there is a need for a scheme
providing a light-load-time-period-remote-casting
25 function which checks operations of individual

1 terminal systems with an aim of providing diligent
delivery control, remote diagnosis, and remote
maintenance by use of a remote control function to
control operations of the terminal systems.

5 Fifth, there is a need for a scheme
providing a light-load-time-period-remote-casting
function which customizes the contents of the
delivered data in accordance with such particulars as
a season, a date, a day, and locations where the
10 terminal systems are installed by using a function to
control a schedule of displaying the contents.

Sixth, there is a need for a scheme
providing a light-load-time-period-remote-casting
function which gives priority to delivered data of
15 such an urgent nature as earthquake information, a
railway accident, etc., over other delivered data by
using a function to control a schedule of displaying
the contents.

Seventh, there is a need for a scheme
20 providing a light-load-time-period-remote-casting
function which eliminates a need for time and labor to
be spent on recording of contents in memory media,
delivery of the memory media, and reading of contents
from the memory media, all of which would be required
25 when the memory media is recorded at the center

1 system, is delivered to the terminal systems, and is
read by the terminal systems so as to deliver contents
in the form of memory media.

5 SUMMARY OF THE INVENTION

Accordingly, it is a general object of the
present invention to provide a scheme which can
satisfy the needs described above.

According to the present invention, a system
10 for delivering contents includes a center system which
delivers the contents, a plurality of terminal systems
which receive the contents from the center system and
displays the contents, and communication lines
connecting the center system to the plurality of
15 terminal systems, wherein the center system includes a
delivery-schedule setting unit which sets a schedule
of delivery, and a contents-delivery unit which
delivers the contents to the terminal systems
according to the schedule of delivery during a time
20 period when a load on the terminal systems is lower
than a predetermined level.

In this manner, the system described above
is provided with a light-load-time-period-remote-
casting function which delivers contents during time
25 period such as a nighttime when terminal systems are

1 idling, the purpose being not to require the terminal
systems to have a high-performance capacity and not to
require the communication network to have a
high-speed-data-transfer capacity so as to avoid a
5 cost increase associated with enhancement of the
terminal systems and to avoid an increase in a
communication-line-usage fee caused by use of a high-
speed-data-transfer network even when moving-picture
information or high-definition images having a large
10 amount of multi-media data in the range of several
hundreds mega-bytes is delivered from the center
system to a plurality of terminal systems with an aim
of delivering commercials on sales goods, notices from
a local community, traffic information, a local
15 weather forecast, or the like.

Further, the light-load-time-period-remote-
casting function can deliver the contents during a
nighttime when a communication fee is relatively
inexpensive for the purpose of avoiding a daytime
20 delivery because such daytime delivery would lead to
an increase in a communication-line-usage fee as it
takes a lengthy time to deliver a large amount of
contents such as moving-picture information or high-
definition images having a large amount of multi-media
25 data in the range of several hundreds mega-bytes.

1 According to another aspect of the present
invention, the system as described above is such that
the center system further includes a terminal-system-
control unit which registers and controls terminal-
5 attribute information about attributes of the terminal
systems, wherein the contents-delivery unit selects
some of the plurality of terminal systems based on the
terminal-attribute information, and delivers the
contents to the selected terminal systems.

10 In the system described above, the center
system can customize the contents delivered to
particular terminal systems by selecting particular
terminal systems for delivering particular contents.

 According to another aspect of the present
15 invention, the system as described above is such that
the center system further includes a display-schedule
setting unit which sets a schedule of display, wherein
the contents-delivery unit delivers the contents and
the schedule of display to the terminal systems, the
20 schedule of display defining a schedule according to
which the contents are displayed on the terminal
systems. Further, each of the plurality of terminal
systems includes a receiving unit which receives the
contents and the schedule of display from the center
25 system, a display unit, and a terminal-control unit

1 which displays the contents on the display unit
according to a schedule specified in the schedule of
display.

5 The system described above is provided with
a remote control function to control operations of the
terminal systems. Based on this function, the
displayed contents can be customized in accordance
with a season, a date, a day, and locations where the
terminal systems are installed. Further, such a
10 remote control function can give priority to contents
of an urgent nature such as earthquake information,
railway-accident information, etc., over other routine
contents.

15 According to another aspect of the present
invention, the system as described above is such that
each of the plurality of terminal systems includes a
receiving unit which receives the contents from the
center system, a first display unit which displays the
contents on a screen thereof, a monitor camera which
20 takes a picture of the screen of the first display
unit, and a still-image-transmission unit which sends
the picture to the center device. Further, the center
system includes a second display unit which displays a
plurality of pictures of the screen of the first
25 display unit taken at intervals during a last

1 predetermined time period.

The system described above allows the transmission side (i.e., the center system) to check whether delivered contents are actually displayed on terminal systems by using a remote monitoring function to monitor operations of the terminal systems.

Other objects and further features of the present invention will be apparent from the following detailed description when read in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Figs.1A through 1I are illustrative drawings showing a list of functions provided for a center system of a multi-media-automatic-delivery system according to the present invention;

Fig.2 is an illustrative drawing for explaining the functions of a server PC;

Fig.3 is an illustrative drawing showing an embodiment of the multi-media-automatic-delivery system according to the present invention;

Fig.4 is an illustrative drawing of a first embodiment of the multi-media-automatic-delivery system;

Fig.5 is an illustrative drawing of the

1 first embodiment of the multi-media-automatic-delivery
system;

Fig.6 is an illustrative drawing of the
first embodiment of the multi-media-automatic-delivery
5 system;

Fig.7 is an illustrative drawing showing a
configuration for delivering advertisement-contents
data in the multi-media-automatic-delivery system of
Fig.6;

10 Fig.8 is an illustrative drawing showing
data flows associated with various functions of the PC
server;

Fig.9 is an illustrative drawing showing a
configuration for delivering advertisement-contents
15 data in the multi-media-automatic-delivery system of
Fig.6;

Fig.10 is an illustrative drawing showing a
display sequence when the sequence is suspended due to
a trouble such as a power failure;

20 Fig.11 is an illustrative drawing of a
second embodiment of the multi-media-automatic-
delivery system;

Fig.12 is an illustrative drawing showing
data flows of contents data in the multi-media-
25 automatic-delivery system of Fig.11;

1 Fig.13 is an illustrative drawing showing
data flows associated with various functions of a PC
server of the multi-media-automatic-delivery system of
Fig.11;

5 Fig.14 is an illustrative drawing showing a
display sequence when the sequence is suspended due to
a trouble such as a power failure in the multi-media-
automatic-delivery system of Fig.11;

 Fig.15 is a block diagram showing a
10 functional configuration of the center system and a
given one of the terminal systems; and

 Fig.16 is an illustrative drawing showing a
configuration of a related-art scheme.

15 DESCRIPTION OF THE PREFERRED EMBODIMENTS

 In the following, embodiments of the present
invention will be described with reference to the
accompanying drawings.

 Figs.1A through 1I are illustrative drawings
20 showing a list of functions provided for a center
system (server personal computer) of a multi-media-
automatic-delivery system according to the present
invention. Fig.2 is an illustrative drawing for
explaining the functions of the sender system (server
25 PC). Fig.3 is an illustrative drawing showing an

1 embodiment of the multi-media-automatic-delivery
system according to the present invention.

 A multi-media-automatic-delivery system 10
of this embodiment includes communication lines 11, at
5 least one center system 20, and terminal systems 30.
connected to the center system 20 via the
communication lines 11. The center system 20 delivers
contents data to the terminal systems 30 which are
located at railway stations, convenience stores, etc.,
10 so that the delivered contents are shown on the
display unit 302 of the terminal systems 30. The
contents data include still images and video contents
such as moving pictures 10a, character information
10e, etc., and may represent commercial advertisement.

15 Fig.15 is a block diagram showing a
functional configuration of the center system 20 and a
given one of the terminal system 30.

 In the following, a description will be
given with regard to a case in which the moving
20 pictures 10a for commercial advertisement are
delivered. In this embodiment, the moving pictures
10a for commercial advertisement are provided in
compliance with the MPEG2 scheme, and are hereinafter
referred to as moving-picture-advertisement-contents-
25 MPEG2 data 10a. Use of the moving-picture-

1 advertisement-contents-MPEG2 data 10a in compliance
with the MPEG2 scheme makes it possible to display
high-definition video images comparable to DVD
(digital video disk) images on the display unit 302 of
5 the terminal systems 30.

When such high-definition video images as
comparable to those of the DVD system are delivered in
this embodiment, moving-picture information or high-
definition images having a large amount of multi-media
10 data in the range of several hundreds mega-bytes is
sent from the center system 20 to the terminal systems
30 for the purpose of delivering commercials on sales
goods, notices from a local community, traffic
information, a local weather forecast, or the like.
15 To this end, a contents-delivery unit 204 uses
terminal-attribute information 10c to select some of
the terminal systems 30 to deliver the contents
according to an advertisement-delivery-schedule data
10d generated by a delivery-schedule setting unit 203.
20 The contents are delivered by using an efficient
transfer scheme based on data compression during a
time period when a communication-line-usage fee is
relatively inexpensive. Namely, a daytime delivery of
the contents is avoided since it would lead to an
25 increase in the communication-line-usage fee for the

1 communication lines (ISDN) 11. In this manner, a
light-load-time-period-remote-casting function is
implemented at a low cost so as to cope with the data
amount of moving pictures or high-definition video
5 images comparable to those of the DVD system.

In detail, 500-Mbit data comprised of moving
pictures and high-definition images, which corresponds
to one minute's worth of MPEG2 video contents when
shown on the display unit 302 such as a large-scale
10 plasma display or an aurora vision, may be transmitted
at a data rate of 64 kbs by use of the communication
(ISDN) lines 11. In this case, the light-load-time-
remote-casting function of the present invention can
complete the data delivery within only one hour or
15 two.

Further, when such moving-picture
information or high-definition images comparable to
those of the DVD system as having a large amount of
multi-media data in the range of several hundreds
20 mega-bytes is sent from the center system 20 to the
terminal systems 30 after the contents-delivery unit
204 selects the terminal systems 30 based on the
terminal-attribute information 10c to deliver the
contents according to the advertisement-delivery-
25 schedule data 10d generated by the delivery-schedule

1 setting unit 203 for the purpose of delivering
commercials on sales goods, notices from a local
community, traffic information, a local weather
forecast, or the like, the contents are delivered by
5 using an efficient transfer scheme based on data
compression during a time period when the terminal
systems 30 are idling, the purpose being not to
require the terminal systems 30 to have a high-
performance capacity and not to require the
10 communication (ISDN) lines 11 to have a high-speed-
data-transfer capacity so as to avoid a cost increase
associated with enhancement of the terminal systems 30
and to avoid an increase in a communication-line-usage
fee caused by use of a high-speed-data-transfer
15 network. In this manner, a light-load-time-period-
remote-casting function is implemented at a low cost
so as to cope with the data amount of moving pictures
or high-definition video images comparable to those of
the DVD system.

20 As a result, it is possible to eliminate
time and labor that would be spent on recording the
contents in recording media such as magneto-optical
memory media or magnetic disks at the site of the
center system 20. Also, time and labor spent on the
25 delivery of the recording media to the terminal

1 systems 30 are eliminated. Further, there is no need
to spend time and labor on loading the recording media
to the reading devices of the terminal systems 30 so
as to store the contents in the terminal systems 30.
5 In this manner, a light-load-time-period-remote-
casting function is implemented so as to eliminate a
need for time and labor to be spent on recording of
contents in memory media, delivery of the memory
media, and reading of contents from the memory media.

10 The center system 20 includes a terminal-
system-control unit 201, a contents-control unit 202,
the delivery-schedule setting unit 203, the contents-
delivery unit 204, a display-schedule setting unit
205, and a compression-and-coding unit 206.

15 Basically, the center system 20 is implemented by a
server personal computer. As shown in the figures
(Figs.1A through 1I, Fig.2, Fig.3, and Fig.15), the
terminal-system-control unit 201 is equipped with a
function to register and control the terminal-
20 attribute information 10c regarding the terminal
systems 30. The terminal-system-control unit 201 is
implemented by a microcomputer provided inside the
server PC.

The terminal-system-control unit 201, as
25 shown in the figures, uses advertisement-display-

1 schedule data 10b to achieve remote control of
terminal systems 30 with regard to a display schedule
thereof when the advertisement-display-schedule data
10b is sent to the terminal systems 30. When the
5 advertisement-display-schedule data 10b after updating
thereof is sent to the terminal systems 30, it is
possible to change a date and time at which the
moving-picture-advertisement-contents-MPEG2 data 10a
is displayed on the display unit 302 such as a large-
10 scale plasma display or an aurora vision. Also, the
moving-picture-advertisement-contents-MPEG2 data 10a
displayed on the display unit 302 can be changed via
an emergency remote control function implemented in
the manner as described above.

15 In this manner, the center system 20 is
provided with a remote-control function to control
operations of the terminal systems 30, and can check
operation conditions of the individual terminal
systems 30 so as to provide diligent delivery control,
20 remote diagnosis, and remote maintenance. Further,
since a function to control the advertisement-display-
schedule data 10b is provided, a light-load-time-
period-remote-casting function can give priority to
contents of an urgent nature such as earthquake
25 information, fire information, railway-accident

1 information, etc., over any other contents. Namely,
the advertisement-display-schedule data 10b alone can
be delivered with an update thereof even after the
contents were sent, so as to change the date and time
5 of displaying of the contents at the terminal systems
30. This can be achieved economically by using
existing infrastructure, whereas such a change in the
date and time of displaying is not possible in the
related-art schemes, which are based on either
10 delivery of recording media or one-way delivery of
contents.

As shown in the figures, the contents-
control unit 202 registers the advertisement-moving-
picture contents, which are to be sent to the terminal
15 systems 30 via the communication lines 11. Further,
the contents-control unit 202 is provided with a
function to generate information regarding control of
the registered advertisement-moving-picture contents.
This is implemented by the microcomputer provided
20 inside the server PC. The terminal-system-control
unit 201 exchanges the terminal-attribute information
10c with the contents-control unit 202 so as to attend
to contents-delivering processing with respect to each
of the terminal systems 30 or with each group of the
25 terminal systems 30.

1 In this manner, a light-load-time-period-
delivery-scheduling function is implemented so as to
control the advertisement-delivery-schedule data 10d
and the advertisement-display-schedule data 10b.
5 Based on this, the contents-delivery unit 204 uses the
terminal-attribute information 10c to deliver the
contents individually to each of the selected terminal
systems 30 by taking into account a season, a date, a
day, locations of the terminal systems 30, etc.
10 Further, the contents-delivery unit 204 can customize
the contents with respect to each of the terminal
systems 30 based on characteristics of the terminal
systems 30 as such characteristics are specified in
the terminal-attribute information 10c. Such a
15 function is implemented as the light-load-time-period-
remote-casting function. Also, collaboration between
the terminal-system-control unit 201 and the contents-
control unit 202 makes it possible to deliver the
contents with respect to the selected terminal systems
20 30 or with respect to a selected group of the terminal
systems 30. All of this makes it possible to
implement a delivery-control function which can
provide individually tailored and diligent service to
each of the terminal systems 30. As a result, it is
25 possible to eliminate time and labor that would be

1 spent on recording the contents in recording media
such as magneto-optical memory media or magnetic disks
at the site of the center system 20. Also, time and
labor spent on the delivery of the recording media to
5 the terminal systems 30 are eliminated. Further,
there is no need to spend time and labor on loading
the recording media to the reading devices of the
terminal systems 30 so as to store the contents in the
terminal systems 30. In this manner, a light-load-
10 time-period-remote-casting function is implemented so
as to eliminate a need for time and labor to be spent
on recording of contents in memory media, delivery of
the memory media, and reading of contents from the
memory media.

15 As shown in the figures, the delivery-
schedule setting unit 203 lays out a schedule of
light-load-time-delivery processing for delivering
contents to the terminal systems 30 during a light-
load time period when the load on the terminal systems
20 30 is lower than a predetermined level. This function
is implemented by the microcomputer provided inside
the server PC. Further, the delivery-schedule setting
unit 203 refers to the advertisement-delivery-schedule
data 10d that is already specified and the
25 advertisement-display-schedule data 10b that is

1 already transmitted, thereby controlling delivery
operations for sending the advertisement-moving-
picture contents.

 Namely, the light-load-time-period-remote-
5 casting function based on the delivery-schedule
setting unit 203 and the display-schedule setting unit
205 allows the contents-delivery unit 204 to use the
terminal-attribute information 10c to deliver the
contents individually to each of the selected terminal
10 systems 30 by taking into account a season, a date, a
day, locations of the terminal systems 30, etc.
Further, the contents-delivery unit 204 can customize
the contents with respect to each of the terminal
systems 30 based on characteristics of the terminal
15 systems 30 as such characteristics are specified in
the terminal-attribute information 10c. Such a
function is implemented as the light-load-time-period-
remote-casting function. Further, since a function to
control the advertisement-display-schedule data 10b is
20 provided, a light-load-time-period-remote-casting
function can give priority to contents of an urgent
nature such as earthquake information, fire
information, railway-accident information, etc., over
any other contents. As a result, it is possible to
25 eliminate time and labor that would be spent on

1 recording the contents in recording media such as
magneto-optical memory media or magnetic disks at the
site of the center system 20. Also, time and labor
spent on the delivery of the recording media to the
5 terminal systems 30 are eliminated. Further, there is
no need to spend time and labor on loading the
recording media to the reading devices of the terminal
systems 30 so as to store the contents in the terminal
systems 30. In this manner, a light-load-time-period-
10 remote-casting function is implemented so as to
eliminate a need for time and labor to be spent on
recording of contents in memory media, delivery of the
memory media, and reading of contents from the memory
media.

15 The delivery-schedule setting unit 203 is
provided with the light-load-time-delivery-scheduling
function, which sets a schedule of contents delivery
so as to deliver the advertisement-moving-picture
contents to the terminal systems 30 during a light-
20 load time period when the load on the terminal systems
30 is lower than a predetermined level, especially
during a nighttime when the devices are idling or
stopped. In this embodiment, public telephone lines
are used as the communication lines 11. In detail,
25 ISDN lines with a 64-kbps data-transfer rate are used

1 (hereinafter, the communication lines 11 may be
referred to as the ISDN lines 11). Because of this
configuration, the terminal-attribute information 10c
includes telephone numbers of the terminal systems 30
5 (i.e., telephone numbers of lines connected to DSUs).

When the delivery-schedule setting unit 203
sets the advertisement-delivery-schedule data 10d for
delivering the moving-picture-advertisement-contents-
MPEG2 data 10a to the terminal systems 30, the
10 delivery-schedule setting unit 203 checks available
time periods in the displaying schedules of the
terminal systems 30, available time periods in the
delivery schedule for delivering the moving-picture-
advertisement-contents-MPEG2 data 10a to the terminal
15 systems 30, and a light-load time period of the
terminal systems 30. Based on this check, the
delivery-schedule setting unit 203 decides appropriate
time periods for delivering contents, and estimates
time lengths which would be required for such
20 deliveries. In this manner, the light-load-time-
period-delivery-scheduling function is implemented so
as to deliver the contents during such a time period
as to warrant the lowest fee and a reliable delivery.

The light-load-time-period-delivery-
25 scheduling function as described above can bring about

1 the following improvements. When such moving-picture
information or high-definition images comparable to
those of the DVD system as having a large amount of
multi-media data in the range of several hundreds
5 mega-bytes is sent from the center system 20 to the
terminal systems 30 after the contents-delivery unit
204 selects the terminal systems 30 based on the
terminal-attribute information 10c to deliver the
contents according to the advertisement-delivery-
10 schedule data 10d and the advertisement-display-
schedule data 10b generated at the center system 20
for the purpose of delivering commercials on sales
goods, notices from a local community, traffic
information, a local weather forecast, or the like,
15 the contents are delivered by using an efficient
transfer scheme based on data compression during a
nighttime, the purpose being to avoid an increase in a
communication-line-usage fee caused by use of the ISDN
lines 11 during daytime for a long time period for
20 delivering a large amount of the data. In this
manner, the light-load-time-period-remote-casting
function is implemented at a low cost so as to cope
with the data amount of moving pictures or high-
definition video images comparable to those of the DVD
25 system. In detail, 500-Mbit data comprised of moving

1 pictures and high-definition images, which corresponds
to one minute's worth of MPEG2 video contents when
shown on the display unit 302 such as a large-scale
plasma display or an aurora vision, may be transmitted
5 at a data rate of 64 kbs by use of the communication
(ISDN) lines 11. In this case, the light-load-time-
remote-casting function of the present invention can
complete the data delivery within only one hour or
two.

10 Further, when such moving-picture
information or high-definition images comparable to
those of the DVD system as having a large amount of
multi-media data in the range of several hundreds
mega-bytes is sent from the center system 20 to the
15 terminal systems 30 after the contents-delivery unit
204 selects the terminal systems 30 based on the
terminal-attribute information 10c to deliver the
contents according to the advertisement-delivery-
schedule data 10d and the advertisement-display-
20 schedule data 10b generated at the center system 20
for the purpose of delivering commercials on sales
goods, notices from a local community, traffic
information, a local weather forecast, or the like,
the contents are delivered by using an efficient
25 transfer scheme based on data compression during a

1 light-load time period such as a nighttime when the
terminal systems 30 are idling, the purpose being not
to require the terminal systems 30 to have a high-
performance capacity and not to require the
5 communication lines to have a high-speed-data-transfer
capacity so as to avoid a cost increase associated
with enhancement of the terminal systems 30 and to
avoid an increase in a communication-line-usage fee
caused by use of a high-speed-data-transfer network.
10 In this manner, the light-load-time-period-remote-
casting function is implemented at a low cost so as to
cope with the data amount of moving pictures or high-
definition video images comparable to those of the DVD
system. This remote-delivery function directed to
15 delivery of high-definition moving pictures (i.e., the
light-load-time-period-remote-casting function) can be
achieved economically by using existing
infrastructure, whereas such a function cannot be
implemented in the related-art schemes which are based
20 on either delivery of recording media or one-way
delivery of contents.

As shown in the figures, the contents-
delivery unit 204 selects the advertisement-moving-
picture contents based on the advertisement-contents-
25 control information so as to deliver the contents to

1 the terminal systems 30 during a time period such as a
nighttime when the device operation is in a halt
condition or in an idling condition. To deliver the
contents, the contents-delivery unit 204 accesses the
5 terminal systems 30 via the ISDN lines 11 based on the
terminal-attribute information 10c regarding the
terminal systems 30 (i.e., calls the DSUs of the
terminal systems 30), and attends to light-load-time-
period-delivery processing for sending the
10 advertisement-moving-picture contents to the terminal
systems 30 during a light-load-time period such as a
nighttime. In this manner, the
light-load-time-period-remote-casting function is
implemented.

15 Accordingly, when such moving-picture
information or high-definition images comparable to
those of the DVD system as having a large amount of
multi-media data in the range of several hundreds
mega-bytes is sent from the center system 20 to the
20 terminal systems 30 after the contents-delivery unit
204 selects the terminal systems 30 based on the
terminal-attribute information 10c to deliver the
contents according to the advertisement-delivery-
schedule data 10d generated by the delivery-schedule
25 setting unit 203 for the purpose of delivering

1 commercials on sales goods, notices from a local
community, traffic information, a local weather
forecast, or the like, the contents are delivered by
using an efficient transfer scheme based on data
5 compression during a nighttime, the purpose being to
avoid an increase in a communication-line-usage fee
caused by use of the ISDN lines 11 during a daytime
for a long time period for delivering a large amount
of the data. In this manner, the light-load-time-
10 period-remote-casting function is implemented at a low
cost so as to cope with the data amount of moving
pictures or high-definition video images comparable to
those of the DVD system. In detail, 500-Mbit data
comprised of moving pictures and high-definition
15 images, which corresponds to one minute's worth of
MPEG2 video contents when shown on the display unit
302 such as a large-scale plasma display or an aurora
vision, may be transmitted at a data rate of 64 kbs by
use of the communication (ISDN) lines 11. In this
20 case, the light-load-time-remote-casting function of
the present invention can complete the data delivery
within only one hour or two.

Further, when such moving-picture
information or high-definition images comparable to
25 those of the DVD system as having a large amount of

1 multi-media data in the range of several hundreds
mega-bytes is sent from the center system 20 to the
terminal systems 30 after the contents-delivery unit
204 selects the terminal systems 30 based on the
5 terminal-attribute information 10c to deliver the
contents according to the advertisement-delivery-
schedule data 10d generated by the delivery-schedule
setting unit 203 for the purpose of delivering
commercials on sales goods, notices from a local
10 community, traffic information, a local weather
forecast, or the like, the contents are delivered by
using an efficient transfer scheme based on data
compression during a time period such as a nighttime
when the terminal systems 30 are idling, the purpose
15 being not to require the terminal systems 30 to have a
high-performance capacity and not to require the
communication lines to have a high-speed-data-transfer
capacity so as to avoid a cost increase associated
with enhancement of the terminal systems 30 and to
20 avoid an increase in a communication-line-usage fee
caused by use of a high-speed-data-transfer network.
In this manner, a light-load-time-period-remote-
casting function is implemented at a low cost so as to
cope with the data amount of moving pictures or high-
25 definition video images comparable to those of the DVD

1 system. As a result, it is possible to eliminate time
and labor that would be spent on recording the
contents in recording media such as magneto-optical
memory media or magnetic disks at the site of the
5 center system 20. Also, time and labor spent on the
delivery of the recording media to the terminal
systems 30 are eliminated. Further, there is no need
to spend time and labor on loading the recording media
to the reading devices of the terminal systems 30 so
10 as to store the contents in the terminal systems 30.
In this manner, the light-load-time-period-remote-
casting function is implemented so as to eliminate a
need for time and labor to be spent on recording of
contents in memory media, delivery of the memory
15 media, and reading of contents from the memory media.
This remote-delivery function directed to delivery of
high-definition moving pictures (i.e., the light-load-
time-period-remote-casting function) can be achieved
economically by using existing infrastructure, whereas
20 such a function cannot be implemented in the related-
art schemes which are based on either delivery of
recording media or one-way delivery of contents.

As shown in the figures, the contents-
delivery unit 204 selects the advertisement-moving-
25 picture contents based on the advertisement-contents-

1 control information so as to deliver the contents to
the terminal systems 30 based on the advertisement-
delivery-schedule data 10d during the light-load time
period. To deliver the contents, the contents-
5 delivery unit 204 accesses the terminal systems 30 via
the ISDN lines 11 by performing a communication-line
establishing process based on the telephone-number
information (i.e., calls the DSUs of the terminal
systems 30), and attends to light-load-time-period-
10 delivery processing for sending the advertisement-
moving-picture contents to the terminal systems 30 via
the ISDN lines 11 during the light-load time period
based on the advertisement-delivery-schedule data 10d
regarding the terminal systems 30. In this manner,
15 the light-load-time-period-remote-casting function is
implemented. In this embodiment, this function is
performed by the microcomputer of the server PC.

In this manner, the remote control function
is provided for the purpose of controlling operations
20 of the terminal systems 30 from the center system 20
when the terminal systems 30 are selected based on the
telephone-number information. Namely, the operation
conditions of the terminal systems 30 can be checked
individually so as to provide diligent delivery
25 control, remote diagnosis, and remote maintenance with

1 respect to each of the terminal systems 30. Such a
light-load-time-period-remote-casting function
provides a maintenance-free condition for the terminal
systems 30.

5 Further, a function is provided to control
the advertisement-delivery-schedule data 10d regarding
the terminal systems 30 selected based on the
telephone-number information. Based on this, the
contents-delivery unit 204 uses the terminal-attribute
10 information 10c to deliver the contents individually
to each of the selected terminal systems 30 by taking
into account a season, a date, a day, locations of the
terminal systems 30, etc. Further, the contents-
delivery unit 204 can customize the contents with
15 respect to each of the terminal systems 30 based on
characteristics of the terminal systems 30 as such
characteristics are specified in the terminal-
attribute information 10c. Such a function is
implemented as the light-load-time-period-remote-
20 casting function. As a result, the remote-delivery
function directed to delivery of high-definition
moving pictures (i.e., the light-load-time-period-
remote-casting function) can be achieved economically
by using existing infrastructure, whereas such a
25 function cannot be implemented in the related-art

1 schemes which are based on either delivery of
recording media or one-way delivery of contents.

The terminal-attribute information 10c of
the present embodiment includes identification numbers
5 of the terminal systems 30. In this case, as shown in
the figures, when the contents-delivery unit 204
selects the advertisement-moving-picture contents
based on the advertisement-contents-control
information so as to deliver the contents to the
10 terminal systems 30 based on the advertisement-
delivery-schedule data 10d during the light-load time
period, the terminal systems 30 are selected based on
the identification-number information, and the
delivery of the contents is performed automatically
15 based on the advertisement-delivery-schedule data 10d.
This is performed by the
light-load-time-period-remote-casting function. In
this manner, the operation conditions of the terminal
systems 30 selected based on the identification-number
20 information can be controlled from the center system
20 via a remote-control function. Based on this
function, the operation conditions of the terminal
systems 30 can be checked individually so as to
provide diligent delivery control, remote diagnosis,
25 and remote maintenance with respect to each of the

1 terminal systems 30. This is implemented as the
light-load-time-period-remote-casting function.

As shown in the figures, the terminal-
attribute information 10c has a data structure which
5 includes a field for specifying places where the
terminal systems 30 are installed (e.g., railway
stations, convenient stores, department stores, and
the like). In this case, when the contents-delivery
unit 204 selects the advertisement-moving-picture
10 contents based on the advertisement-contents-control
information so as to deliver the contents to the
terminal systems 30 based on the advertisement-
delivery-schedule data 10d during the light-load time
period, the terminal systems 30 are selected based on
15 the installed-place information, and the delivery of
the contents is performed automatically based on the
advertisement-delivery-schedule data 10d. This is
performed by the light-load-time-period-remote-casting
function. In this manner, the operation conditions of
20 the terminal systems 30 selected based on the
installed-place information can be controlled from the
center system 20 via the remote-control function.
Based on this function, the operation conditions of
the terminal systems 30 can be checked individually so
25 as to provide diligent delivery control, remote

1 diagnosis, and remote maintenance with respect to each
of the terminal systems 30. This is implemented as
the light-load-time-period-remote-casting function.

The display-schedule setting unit 205, as
5 shown in the figures, is provided with a function to
set a schedule for displaying of advertisement-moving-
picture contents so as to control the terminal systems
30 with regard to a displaying operation thereof. In
this embodiment, this function is provided by the
10 microcomputer inside the server PC. In this case when
the contents-delivery unit 204 selects the
advertisement-moving-picture contents based on the
advertisement-contents-control information so as to
deliver the contents to the terminal systems 30 during
15 the light-load time period based on the advertisement-
delivery-schedule data 10d, the contents-delivery unit
204 accesses the terminal systems 30 via the ISDN
lines 11 based on the terminal-attribute information
10c of the terminal systems 30 (i.e., calls the DSUs
20 of the terminal systems 30). Then, the contents-
delivery unit 204 attends to light-load-time-period-
delivery processing for sending the advertisement-
moving-picture contents and the advertisement-display-
schedule data 10b to the terminal systems 30 during
25 the light-load-time period based on the advertisement-

1 delivery-schedule data 10d. Further, since the
function to control the advertisement-display-schedule
data 10b is provided, a light-load-time-period-remote-
casting function can give priority to contents of an
5 urgent nature such as earthquake information, fire
information, railway-accident information, etc., over
any other contents. In detail, the advertisement-
delivery-schedule data 10d that is already set and the
advertisement-display-schedule data 10b that is
10 already transmitted are referred to, so that the
advertisement-delivery-schedule data 10d is updated to
include appropriate contents. For example, when the
advertisement-delivery-schedule data 10d needs to be
set in a given one of the terminal systems 30, a check
15 is made to find available time periods in the
displaying schedules of the given one of the terminal
systems 30, available time periods in the delivery
schedule for delivering the moving-picture-
advertisement-contents-MPEG2 data 10a to the given one
20 of the terminal systems 30, and a light-load time
period of the given one of the terminal systems 30.
Based on this check, a decision is made to select
appropriate time periods for delivering contents, and
an estimate is obtained with regard to time lengths
25 which would be required for such deliveries. In this

1 manner, the contents are delivered during such a time
period as to warrant the lowest fee and a reliable
delivery.

5 The compression-and-coding unit 206, as
shown in the figures, is provided with a function to
generate the moving-picture-advertisement-contents-
MPEG2 data 10a that is compressed and encoded. This
unit is implemented by the microcomputer provided
inside the server PC. In this case, when the
10 contents-delivery unit 204 selects the advertisement-
moving-picture contents based on the advertisement-
contents-control information so as to deliver the
contents to the terminal systems 30 based on the
advertisement-delivery-schedule data 10d during the
15 light-load time period, the terminal systems 30 are
selected based on the identification-number
information, and the compressed contents are
automatically delivered to the selected terminal
systems 30 based on the advertisement-delivery-
20 schedule data 10d of the selected terminal systems 30.
This is performed by the
light-load-time-period-remote-casting function. The
compressing-and-encoding function of the compression-
and-coding unit 206 provides the following advantages.
25 Namely, when moving-picture information or high-

1 definition images having a large amount of multi-media
data in the range of several hundreds mega-bytes is
sent from the center system 20 to the terminal systems
30 after the contents-delivery unit 204 selects the
5 terminal systems 30 based on the terminal-attribute
information 10c for the purpose of delivering
commercials on sales goods, notices from a local
community, traffic information, a local weather
forecast, or the like, the contents after compression
10 thereof are delivered during a time period when the
communication-line-usage fee is relatively
inexpensive, the purpose being to avoid an increase in
a communication-line-usage fee caused by use of the
ISDN lines 11 during daytime for a long time period
15 for delivering a large amount of the data. In this
manner, the light-load-time-period-remote-casting
function is implemented at a low cost so as to cope
with the delivery of multi-media data such as moving
pictures or high-definition images. In detail, 500-
20 Mbit data comprised of moving pictures and high-
definition images, which corresponds to one minute's
worth of MPEG2 video contents, may be transmitted at a
data rate of 64 kbs by use of the communication (ISDN)
lines 11. In this case, the light-load-time-remote-
25 casting function of the present invention can complete

1 the data delivery within only one hour or two. As a
result, it is possible to eliminate time and labor
that would be spent on recording the contents in
recording media such as magneto-optical memory media
5 or magnetic disks at the site of the center system 20.
Also, time and labor spent on the delivery of the
recording media to the terminal systems 30 are
eliminated. Further, there is no need to spend time
and labor on loading the recording media to the
10 reading devices of the terminal systems 30 so as to
store the contents in the terminal systems 30. In
this manner, a light-load-time-period-remote-casting
function is implemented so as to eliminate a need for
time and labor to be spent on recording of contents in
15 memory media, delivery of the memory media, and
reading of contents from the memory media.

As described above, the compression-and-
coding unit 206 is provided with the function to
generate the moving-picture-advertisement-contents-
20 MPEG2 data 10a that is compressed and encoded. In
this case, when the contents-delivery unit 204 selects
the advertisement-moving-picture contents based on the
advertisement-contents-control information so as to
deliver the contents to the terminal systems 30 based
25 on the advertisement-delivery-schedule data 10d during

1 the light-load time period, the contents-delivery unit
204 accesses the terminal systems 30 via the ISDN
lines 11 based on the terminal-attribute information
10c of the terminal systems 30 (i.e., calls the DSUs
5 of the terminal systems 30), and attends to automatic
light-load-time-period-delivery processing for sending
the advertisement-moving-picture contents and the
advertisement-display-schedule data 10b to the
terminal systems 30 during the light-load-time period
10 according to the advertisement-delivery-schedule data
10d of the terminal systems 30. This is performed by
the light-load-time-period-remote-casting function.
The compressing-and-encoding function of the
compression-and-coding unit 206 and the light-load-
15 time-period-delivery-scheduling process based on the
delivery-schedule setting unit 203 provide the
following advantages. Namely, when moving-picture
information or high-definition images having a large
amount of multi-media data in the range of several
20 hundreds mega-bytes is sent from the center system 20
to the terminal systems 30 after the contents-delivery
unit 204 selects the terminal systems 30 based on the
terminal-attribute information 10c to deliver the
contents according to the advertisement-delivery-
25 schedule data 10d generated by the delivery-schedule

1 setting unit 203 for the purpose of delivering
commercials on sales goods, notices from a local
community, traffic information, a local weather
forecast, or the like, the contents after compression
5 thereof are delivered during a time period when the
communication-line-usage fee is relatively
inexpensive, the purpose being to avoid an increase in
a communication-line-usage fee caused by use of the
ISDN lines 11 during daytime for a long time period
10 for delivering a large amount of the data. In this
manner, the light-load-time-period-remote-casting
function is implemented at a low cost so as to cope
with the delivery of multi-media data such as moving
pictures or high-definition images. In detail, 500-
15 Mbit data comprised of moving pictures and high-
definition images, which corresponds to one minute's
worth of MPEG2 video contents when displayed on the
display unit 302 such as a large-scale plasma display
or the aurora vision, may be transmitted at a data
20 rate of 64 kbs by use of the communication (ISDN)
lines 11. In this case, the light-load-time-remote-
casting function of the present invention can complete
the data delivery within only one hour or two. As a
result, it is possible to eliminate time and labor
25 that would be spent on recording the contents in

1 recording media such as magneto-optical memory media
or magnetic disks at the site of the center system 20.
Also, time and labor spent on the delivery of the
recording media to the terminal systems 30 are
5 eliminated. Further, there is no need to spend time
and labor on loading the recording media to the
reading devices of the terminal systems 30 so as to
store the contents in the terminal systems 30. In
this manner, a light-load-time-period-remote-casting
10 function is implemented so as to eliminate a need for
time and labor to be spent on recording of contents in
memory media, delivery of the memory media, and
reading of contents from the memory media. Namely,
the remote-delivery function directed to delivery of
15 high-definition moving pictures (i.e., the light-load-
time-period-remote-casting function) can be achieved
economically by using existing infrastructure, whereas
such a function cannot be implemented in the related-
art schemes which are based on either delivery of
20 recording media or one-way delivery of contents.

The center system 20 further includes a
still-image receiving unit 207, a still-image storing
unit 208, a still-image decompressing unit 209, and a
display unit 210. These units are provided in order
25 to achieve a remote monitoring function to check

1 whether the moving-picture-advertisement-contents-
MPEG2 data 10a is displayed as expected on the display
unit 302 of the terminal systems 30.

5 The still-image receiving unit 207 has a
function to receive compressed-still-image data sent
from a still-image-transmission unit 314 via the
communication lines 11. The still-image receiving
unit 207 is implemented by the microprocessor of the
server PC.

10 The still-image storing unit 208 serves a
function to store the compressed-still-image data
received by the still-image receiving unit 207, and is
implemented through a RAM inside the server PC. The
still-image decompressing unit 209 is provided with a
15 function to read the compressed-still-image data from
the still-image storing unit 208 at constant intervals
and to decode and decompress the data. This function
is provided by the microcomputer of the server PC.
The display unit 210 displays the still-image data on
20 a remote-monitoring screen with respect to each of the
terminal systems 30, and is implemented by a CRT of
the server PC.

25 The remote-monitoring function is achieved
as follows. When the terminal-control unit sends the
still-image data to the display unit 210 at constant

1 intervals and the still-image decompressing unit 209
is instructed to decompress the still-image data, a
plurality of still images are simultaneously displayed
on the remote-monitoring screen so as to include the
5 most recent still image and immediately preceding
still images obtained within a predetermined time
period. As a new still image is added to the set of
displayed images, the oldest still image is removed
from the display since this image was obtained more
10 than a predetermined time period before the newest
still image. Such display control is provided by a
multi-window-display function. In this manner,
contents of an urgent nature such as earthquake
information, fire information, railway-accident
15 information, etc., can be given priority over other
contents in terms of an order of display in which
contents are displayed on the display unit 302 such as
a large-scale plasma display or an aurora vision.
This is achieved as part of the
20 light-load-time-period-remote-casting function. As a
result, the function of displaying emergency
information and the function of displaying
advertisement can be accommodated together to serve
their respective purposes whereas such a coexistence
25 is not possible in the related-art schemes which are

1 based on either delivery of recording media or one-way
delivery of contents.

As shown in the figure, the center system 20
further includes a character-information receiving
5 unit 211, an identification unit 212, a terminal-
selection unit 213, and a transmission unit 214 in
order to implement a security-control function. As
shown in the figures, the character-information
receiving unit 211 receives the character information
10 10e, identification data 10f, and selection data from
the ISDN lines 11. This unit is implemented via the
microcomputer of the server PC, a DSU, and a TA. The
identification unit 212 identify the terminal systems
30 and users based on the received identification data
15 10f, and is implemented via the microcomputer of the
server PC. The terminal-selection unit 213 has a
function to select the terminal systems 30 based on
the received selection data so that the character
information 10e is sent to the selected terminal
20 systems 30. This unit is also implemented via the
microcomputer of the server PC.

The transmission unit 214 serves a function
to transmit the received character information 10e to
the selected terminal systems 30 only when valid
25 identifications are obtained. The microcomputer of

1 the server PC, the DSU, and the TA together provide
the function of this unit. Because of all of this,
authorized users using authorized terminal systems 30
can display the character information 10e on the
5 display unit 302 such as a large-scale plasma display
or an aurora vision, or can select the terminal
systems 30 so as to make the character information 10e
displayed on the display unit 302 of the selected
terminal systems 30.

10 Since the character information 10e includes
only a limited amount of data, transmission of such
information via the ISDN lines 11 can be completed in
a short time period, so that use of the character
information 10e is suitable when emergency information
15 requiring a realtime response needs to be displayed.
In such a case, specific information of an urgent
nature can be displayed on a selected set of terminal
systems 30 located in a selected area. Further, the
contents-delivery unit 204 can be provided with a
20 remote-control function to control the operations of
the terminal systems 30 selected based on the
terminal-attribute information 10c. Moreover, the
contents-delivery unit 204 can be provided with a
function to check the operation conditions of the
25 terminal systems 30 selected based on the terminal-

1 attribute information 10c and to provide diligent
delivery control, remote diagnosis, and remote
maintenance.

 The identification function as described
5 above can be combined with the emergency-responding.
function which gives priority to contents of an urgent
nature such as earthquake information, fire
information, railway-accident information, etc., over
any other routine contents. Such a combination can
10 enhance reliability of the information by allowing a
check to be made on the identity of the information
source. This helps to avoid such a situation in which
erroneous emergency information or fake emergency
information are distributed, thereby providing a
15 tight-security delivery function.

 The center system 20 further includes a
memory unit 215 into which a memory medium is
inserted. The center system 20 is provided with a
media-interface function to record moving-picture-
20 advertisement-contents-MPEG2 data 10a in the memory
medium of the memory unit 215. The memory unit 215
may be a removable-disk drive. When the moving-
picture-advertisement-contents-MPEG2 data 10a is
recorded in the removable memory medium inserted into
25 the memory unit 215, the memory medium can be used for

1 installing the contents in a terminal system 30 when
the system is newly installed. This removes a need
for transmitting the contents. Further, the memory
unit 215 can be used as a substitute for a hard drive
5 of the center system 20 when the hard drive suffers
malfunction.

As described above, even when moving-picture
information or high-definition images having a large
amount of multi-media data in the range of several
10 hundreds mega-bytes is sent from the center system 20
to the terminal systems 30 for the purpose of
delivering commercials on sales goods, notices from a
local community, traffic information, a local weather
forecast, or the like, the center system 20 according
15 to the present embodiment can deliver the contents
during a time period when the communication-line-usage
fee is relatively inexpensive, the purpose being to
avoid an increase in a communication-line-usage fee
caused by use of the communication lines during a
20 daytime for a long time period for delivering a large
amount of the data. In this manner, the light-load-
time-period-remote-casting function is implemented at
a low cost so as to cope with the delivery of multi-
media data such as moving pictures or high-definition
25 images. Further, even when moving-picture information

1 or high-definition images having a large amount of
multi-media data in the range of several hundreds
mega-bytes is sent from the center system 20 to the
terminal systems 30 for the purpose of delivering
5 commercials on sales goods, notices from a local
community, traffic information, a local weather
forecast, or the like, the contents are delivered
during a time period when the terminal systems 30 are
idling, the purpose being not to require the terminal
10 systems 30 to have a high-performance capacity and not
to require the communication lines to have a high-
speed-data-transfer capacity so as to avoid a cost
increase associated with enhancement of the terminal
systems 30 and to avoid an increase in a
15 communication-line-usage fee caused by use of a high-
speed-data-transfer network. In this manner, the
light-load-time-period-remote-casting function is
implemented at a low cost so as to cope with delivery
of multi-media data such as moving pictures or high-
20 definition video images. Moreover, based on the
function to control the advertisement-delivery-
schedule data 10d, the contents-delivery unit 204 uses
the terminal-attribute information 10c to deliver the
contents individually to each of the selected terminal
25 systems 30 by taking into account a season, a date, a

1 day, locations of the terminal systems 30, etc.
Further, the contents-delivery unit 204 can customize
the contents with respect to each of the terminal
systems 30 based on characteristics of the terminal
5 systems 30 as such characteristics are specified in
the terminal-attribute information 10c. Such a
function is implemented as the light-load-time-period-
remote-casting function. As a result, it is possible
to eliminate time and labor that would be spent on
10 recording the contents in recording media such as
magneto-optical memory media or magnetic disks at the
site of the center system 20. Also, time and labor
spent on the delivery of the recording media to the
terminal systems 30 are eliminated. Further, there is
15 no need to spend time and labor on loading the
recording media to the reading devices of the terminal
systems 30 so as to store the contents in the terminal
systems 30. In this manner, the light-load-time-
period-remote-casting function is implemented so as to
20 eliminate a need for time and labor to be spent on
recording of contents in memory media, delivery of the
memory media, and reading of contents from the memory
media. Namely, the remote-delivery function directed
to delivery of high-definition moving pictures (i.e.,
25 the light-load-time-period-remote-casting function)

1 can be achieved economically by using existing
infrastructure, whereas such a function cannot be
implemented in the related-art schemes which are based
on either delivery of recording media or one-way
5 delivery of contents.

 The terminal systems 30 are installed at
railway stations, convenient stores, and the like, and
is equipped with a function to display the moving-
picture-advertisement-contents-MPEG2 data 10a on the
10 display unit 302. Each of the terminal systems 30
includes a receiving unit 301, the display unit 302, a
terminal-control unit 303, and a decompression unit
304, and is implemented via a client personal computer
(PC). The receiving unit 301 serves a function to
15 receive the moving-picture-advertisement-contents-
MPEG2 data 10a and/or the advertisement-display-
schedule data 10b sent via the ISDN lines 11. This
function is implemented via a microcomputer provided
inside the client PC. The display unit 302 includes a
20 display 3021 for displaying the moving-picture-
advertisement-contents-MPEG2 data 10a which is
received by the receiving unit 301. In the present
embodiment, a large-scale plasma display, an aurora
vision, or the like is used as the display 3021. In
25 the following, the display 3021 is referred to as a

1 large-scale plasma display 3021. The terminal-control
unit 303 controls an operation for displaying the
moving-picture-advertisement-contents-MPEG2 data 10a
on the display unit 302 based on the advertisement-
5 display-schedule data 10b. This function is also
implemented via the microcomputer provided inside the
client PC. When the contents-delivery unit 204 is
provided with a function to combine the
moving-picture-advertisement-contents-MPEG2 data 10a
10 and the advertisement-display-schedule data 10b into a
single data structure for the purpose of delivery
thereof, the terminal-control unit 303 separates the
advertisement-display-schedule data 10b from the
moving-picture-advertisement-contents-MPEG2 data 10a.
15 The decompression unit 304 serves to decode
and decompress the moving-picture-advertisement-
contents-MPEG2 data 10a that is received in an encoded
and compressed form. This function is implemented via
the microcomputer provided inside the client PC. The
20 decompression unit 304 decodes and decompresses the
moving-picture-advertisement-contents-MPEG2 data 10a
when the receiving unit 301 receives the compressed
moving-picture-advertisement-contents-MPEG2 data 10a
via the ISDN lines 11. In response, the terminal-
25 control unit 303 controls the operation for displaying

1 the moving-picture-advertisement-contents-MPEG2 data
10a on the large-scale plasma display 3021 according
to the advertisement-display-schedule data 10b.
Because of such a decompression mechanism, it is
5 possible to receive in a compressed form the moving-
picture information or high-definition images having a
large amount of multi-media data in the range of
several hundreds mega-bytes when the contents-delivery
unit 204 of the center system 20 needs to send
10 commercials on sales goods, notices from a local
community, traffic information, a local weather
forecast, or the like. Also, the advertisement-moving
picture contents are delivered during a time period
when the communication-line-usage fee is relatively
15 inexpensive, avoiding a daytime during which use of
the ISDN lines 11 for a long time period would lead to
an increase in the communication-line-usage fee. In
this manner, a low-cost solution is provided to cope
with delivery of multi-media data such as moving
20 pictures or high-definition images. Namely, the
remote-delivery function directed to delivery of high-
definition moving pictures (i.e., the light-load-time-
period-remote-casting function) can be achieved
economically by using existing infrastructure, whereas
25 such a function cannot be implemented in the related-

1 art schemes which are based on either delivery of
recording media or one-way delivery of contents.

Each of the terminal systems 30 further
includes a remote-monitoring-purpose monitor camera
5 305, a still-image-compression/encoding unit 306, a
still-image storing unit 307, a selection-data
transmission unit 311, and a still-image-transmission
unit 314. These units are provided for the purpose of
implementing a remote-monitoring function which is
10 used for monitoring whether the moving-picture-
advertisement-contents-MPEG2 data 10a sent from the
center system 20 is displayed as expected on the
large-scale plasma display 3021. The remote-
monitoring-purpose monitor camera 305 takes a picture
15 of what is displayed on the large-scale plasma display
3021, thereby generating still-image data. The
remote-monitoring-purpose monitor camera 305 may be
implemented by a CCD camera connected to the client
PC. The still-image-compression/encoding unit 306
20 applies a compression/encoding process to the still-
image data to generate compressed-still-image data.
This unit is implemented via the microcomputer of the
client PC. The still-image storing unit 307 stores
the compressed-still-image data, and a RAM inside the
25 client PC is used for this purpose. The still-image-

1 transmission unit 314 serves a function to send the
compressed-still-image data stored in the still-image
storing unit 307 to the center system 20. This
function is implemented via the microcomputer of the
5 client PC, a DSU, and a TA. In this manner, the
remote-monitoring function is implemented so as to
allow the center system 20 to monitor the operation
conditions of the terminal systems 30 which are
selected by the contents-delivery unit 204 based on
10 the terminal-attribute information 10c. Namely, a
check can be made as to whether the delivered contents
are displayed as expected on the large-scale plasma
display 3021 of the terminal systems 30 which are
selected by the contents-delivery unit 204 based on
15 the terminal-attribute information 10c. This is
implemented as part of the light-load-time-period-
remote-casting function. In this manner, it is
possible to check what is shown on the large-scale
plasma display 3021 by sampling pictures at constant
20 intervals to provide a set of still pictures obtained
during a predetermined time period prior to a present
moment. There is no need to check the remote-
monitoring monitor of the center system 20 all the
time in order to see if the contents are displayed as
25 expected on the large-scale plasma display 3021 of the

1 terminal systems 30. Further, transmission of the
compressed-still-image data can achieve more economic
use of the ISDN lines 11 compared to transmission of
moving pictures for the remote-monitoring purpose.

5 These functions are economically achieved by using
existing infrastructure, whereas such functions cannot
be implemented in the related-art schemes which are
based on either delivery of recording media or one-way
delivery of contents.

10 The terminal systems 30 and the center
system 20 can implement a superimposing function to
display both the character information 10e and the
moving-picture-advertisement-contents-MPEG2 data 10a
on the large-scale plasma display 3021. To this end,
15 each of the terminal systems 30 further includes a
character-information-transmission unit 308, a
identification-transmission unit 309, and a terminal-
system selecting unit 310. As shown in the figures,
the character-information-transmission unit 308 serves
20 to generate and transmit the character information
10e, and is implemented by the microcomputer of the
client PC, the DSU, and the TA. As shown in the
figures, the identification-transmission unit 309
serves a function to transmit the identification data
25 10f of the terminal and the identification data 10f of

1 the user, and the microprocessor of the client PC, the
DSU, and the TA are used for this purpose. The
terminal-system selecting unit 310 as shown in the
figures is provided with a function to generate
5 selection data for selecting the terminal systems 30
with an aim of having the character information 10e
displayed on the large-scale plasma display 3021 of
the selected terminal systems 30. This function is
implemented by the microprocessor of the client PC.
10 The selection-data transmission unit 311 serves to
transmit the selection data, and is implemented by the
microprocessor of the client PC, the DSU, and the TA.
In this manner, authorized users using authorized
terminal systems 30 can make the character information
15 10e displayed on the large-scale plasma display 3021,
or can select the terminal systems 30 for making the
selected terminal systems 30 display the character
information 10e on the display unit 302 thereof.

Since the character information 10e includes
20 only a limited amount of data, transmission of such
information via the ISDN lines 11 can be completed in
a short time period, so that use of the character
information 10e is suitable when emergency information
requiring a realtime response needs to be displayed.
25 In such a case, specific information of an urgent

1 nature can be displayed on a selected set of terminal
systems 30 located in a selected area. Further, the
contents-delivery unit 204 can be provided with the
remote-control function to control the operations of
5 the terminal systems 30 selected based on the
terminal-attribute information 10c. Moreover, the
contents-delivery unit 204 can be provided with the
function to check the operation conditions of the
terminal systems 30 selected based on the terminal-
10 attribute information 10c and to provide diligent
delivery control, remote diagnosis, and remote
maintenance. The identification function for
identifying users can be combined with the emergency-
responding function which gives priority to contents
15 of an urgent nature such as earthquake information,
fire information, railway-accident information, etc.,
over other routine contents. Such a combination can
enhance reliability of the information by allowing a
check to be made on the identity of the information
20 source. This helps to avoid such a situation in which
erroneous emergency information or fake emergency
information are distributed, thereby providing a
tight-security delivery function.

Each of the terminal system 30 further
25 includes a memory unit 312 into which a memory medium

1 is inserted. Each of the terminal systems 30 is
provided with a media-interface function to read
moving-picture-advertisement-contents-MPEG2 data 10a
from the memory medium of the memory unit 312. The
5 memory unit 312 may be a removable-disk drive. When
the removable memory medium recording therein the
moving-picture-advertisement-contents-MPEG2 data 10a
is provided, the memory medium can be used for
installing the contents in a terminal system 30 when
10 the system is newly installed. This removes a need
for transmitting the contents via the communication
lines. Further, the memory unit 312 can be used as a
substitute for a hard drive of the terminal systems 30
when the hard drive suffers malfunction.

15 As described above, even when moving-picture
information or high-definition images having a large
amount of multi-media data in the range of several
hundreds mega-bytes is sent from the center system 20
to the terminal systems 30 selected by the contents-
20 delivery unit 204 based on the terminal-attribute
information 10c for the purpose of delivering
commercials on sales goods, notices from a local
community, traffic information, a local weather
forecast, or the like, the terminal systems 30
25 according to the present embodiment can receive the

1 contents during a time period when the communication-
line-usage fee is relatively inexpensive, the purpose
being to avoid an increase in a communication-line-
usage fee caused by use of the communication lines
5 during a daytime for a long time period for delivering
a large amount of the data. In this manner, a low-
cost solution is provided to cope with the delivery of
multi-media data such as moving pictures or high-
definition images. Once the center system 20
10 determines and sends a display schedule, there is no
need for center system 20 to control the display
sequence of the terminal systems 30 at every turn.
This results in the load on the center system 20
regarding display control being reduced, so that a
15 single center system can attend to control a large
number of terminal systems 30.

In the following, detailed specifications of
the multi-media-automatic-delivery system 10 as
described above will be described according to the
20 present embodiment.

[1] Features of Multi-Media-Automatic-Delivery System 10

Features of the multi-media-automatic-
delivery system 10 will be described in the following
25 (see Figs.4 and 5).

1

1. High-Image Quality and Low Cost

Contents data is video images comparable to those of the DVD system. The 6-Mbps-advertisement-contents data 10a in compliance with the MPEG2 scheme can be used.

Straightforward transmission of the contents would require communication lines having a large capacity with respect to each of the terminal systems 30. In consideration of this, file transfer is used for the transmission of the contents.

Without adhering to a realtime display operation, contents are delivered during a nighttime when displaying thereof is not necessary. Schedule-control software is used to achieve customized contents display for each of the terminal systems 30.

2. Remote-Monitoring Function

Each of the terminal systems 30 is equipped with a small camera (remote-monitoring-purpose monitor camera 305). The display is monitored at all times, and a still image of the display is transmitted to the center system 20 once in several minutes to several tens of minutes.

The center system 20 displays a thumbnail of the still pictures with respect to each terminal

1 system or with respect to each group of terminal
systems, thereby providing a monitoring function.

3. Registration of Contents Transmission and
Individual Control of the Display-Schedule Data 10b
5 for Each of Terminal Systems 30

A check can be made as to what time period
is available for a given terminal system 30, and a
setting of a display schedule can be made with respect
to each moving-picture-advertisement-contents-MPEG2
10 data 10a.

[3] Usage of the System

a. Places of Installation of Terminal Systems 30
(specified in the terminal-attribute information 10c):
railway stations, underground malls, convenient
15 stores, gasoline stations, etc.

In what follows, a first embodiment of the
multi-media-automatic-delivery system 10 will be
described.

20 [First Embodiment]

[4] Center System 20 (Server PC) (see Figs.1 and
6)

[4-1] Outline (see Figs.1 and 6)

This embodiment is applied to the server
25 system of the multi-media-automatic-delivery system 10

- 1 directed to delivery of contents via a network.
[4-1-1] Outline of Functions of the Multi-Media-
Automatic-Delivery System 10
(4-1-1-1) Delivery of Advertisement-Contents Data
5 10a to Terminal Systems 30 via Communication Lines 11
and Automatic Display Function of Terminal Systems 30

The advertisement-contents data 10a is
transmitted from the server PC 20 via ISDN lines (64
or 128 Kbps) by taking several times to several tens
10 of times as long as a display time.

The terminal systems 30 accumulate the
advertisement-contents data 10a, and display it
according to a specified schedule.

- (4-1-1-2) Function to Display Character
15 Information 10e at Time of Emergency

The character information 10e is delivered
and displayed on the terminal systems 30 so as to
present information of an urgent nature at the time of
emergency such as earthquake as well as to present
20 routine information such as a weather forecast.

[4-1-2] Communication Line 11: ISDN lines 11 (64
kbit/sec or 128 kbit/sec)

- [4-1-3] Displayed Contents: moving pictures,
still images, and a combination thereof (contents data
25 10a)

1 [4-1-4] Types of Advertisement-Contents Data 10a

[4-1-4-1] Moving Pictures

a. MPEG2 data in the range of 6 Mbps is
used.

5 b. It takes one to three minutes to display
one set of the advertisement-contents data 10a.

c. The number of contents stored in one
terminal system 30 is limited to 20 to 50.

[4-1-4-2] Still Images

10 a. JPEG data with a resolution equivalent to
a VGA level

b. No limit to a time period during which
the images are displayed (i.e., the images may be
displayed for only a short period of time or for 24
15 hours)

[4-1-5] Character Message 10e at Time of
Emergency

[4-1-5-1] 5 to 30 characters per message

[4-1-5-2] There are two cases, i.e., the first
20 case in which the character information 10e is
superimposed on the advertisement-contents data 10a
and the second case in which the display of the
advertisement-contents data 10a is suspended so as to
present the character information 10e over the entire
25 screen of the large-scale plasma display 3021.

- 1 [4-1-5-3] The character information 10e requires
realtime handling thereof to a certain extent (i.e.,
needs to be displayed a few seconds to a few minutes
after the delivery thereof).
- 5 [4-1-6] Features of Multi-Media-Automatic-
Delivery System 10
[4-1-6-1] The terminal systems 30 is provided
with a function to display contents according to a
specified schedule.
- 10 [4-1-6-2] Operation costs are low. Since the
moving-picture-contents data 10a can be transmitted by
taking time during a light-load time period such as a
nighttime, there is no need to use communication lines
11 that offer a high-speed and large capacity at a
15 high cost.
- [4-1-7] Others
- [4-2] Classification of Functions of Server PC
(see Fig.1)
- Function to register the advertisement-
- 20 contents data 10a (enter/delete/change)
- Function to search for and display the
advertisement-contents data 10a
- [4-2-2] Contents-Control Function
- Function to register the terminal-attribute
- 25 information 10c (enter/delete/change)

- 1 Function to search for and display the
terminal-attribute information 10c
[4-2-3] Terminal-System-Control Function
 Function to switch on/off the display unit
- 5 Function to establish connection with the
terminal systems 30.
[4-2-4] Display-Schedule-Control Function
 Function to make settings (input/delete/
change)
- 10 Function to make a search and display
[4-2-5] Function to Control Advertisement-
Delivery-Schedule Data 10d
 Function to make settings (input/delete/
change)
- 15 Function to make a search and display
[4-2-6] Data-Delivery Function
 Function to deliver the advertisement-
contents data 10a
[4-2-7] Maintenance Function of Multi-Media-
- 20 Automatic-Delivery System 10
 Maintenance of server PC 20
 Maintenance of terminal systems 30 regarding
a display function thereof
 Maintenance of terminal systems 30 regarding
- 25 a function to deliver character information 10e

1 [4-2-8] Security-Control Function

Function to prevent unauthorized users from
entering or tampering with the system

[4-2-9] Function to Control Delivery of Emergency

5 Character Information 10e

Identification function

Function to deliver the character
information 10e

In the following, each function will be
10 further described in detail (see Figs.6, 7, and 8)

1. Server PC 20

1-1. Contents-Control Function (see Figs.6, 7,
and 8)

15 1-1-0. Outline

The contents-control function controls the
advertisement-contents data 10a and corresponding
attached information such as client names.

1-1-1. Registration of Advertisement-Contents
20 Data 10a and Attached Information

1. Registration

Contents themselves and the advertisement-
contents data 10a are registered. The advertisement-
contents data 10a includes the following.

25 (1) Contents name

1 (2) Date of registration in the server PC 20
 (3) Client name (Advertisement agent/
 client)

 (4) Location of display (an item of the
5 terminal-attribute information 10c)

 (5) Data type (moving picture, still image)

 Client name includes a client name and an
advertisement-agent name.

 As locations of display, more than one
10 entries such as an area name, a railway station name,
 etc., are made.

2. Registered advertisement-contents data 10a can
be edited and deleted.

1-1-2. Search/Display of Advertisement-Contents

15 Data 10a

1. A search is conducted based on a specified
client name, a terminal-system name (an item of the
terminal-attribute information 10c), or a contents
name, and search results are displayed.

20 A search is conducted based on a specified
client name, a terminal-system name (an item of the
terminal-attribute information 10c), or a contents
name, and the advertisement-contents data 10a obtained
as a result of the search is displayed.

25 1-2. Function to Control Terminal System (see

1 Figs.6, 7, and 8)

1-2-0. Outline

1. Information necessary for controlling the terminal systems 30 is registered and controlled.

5 1-2-1. Function to Register Terminal-Attribute Information 10c

1. The terminal-attribute information 10c is registered. The terminal-attribute information 10c includes the following items.

10 (1) Terminal-system name (identification number of the terminal system 30)

(2) Telephone number

(3) Location of Display

(4) Advertisement-contents data 10a (see

15 1-1-1, 1.)

(5) Display schedule of the advertisement-contents data 10a (see 1-4-1)

(6) Advertisement-delivery-schedule data 10d of the advertisement-contents data 10a (see 1-5-1)

20 2. Registered terminal-attribute information 10c can be edited and deleted.

1-2-2. Function to Retrieve and Display Terminal-Attribute Information 10c

The terminal-attribute information 10c is
25 retrieved based on a specified terminal-system name

1 (an item of the terminal-attribute information 10c),
and is displayed upon retrieval.

1-3. Remote Control Function to Control Terminal
System 30 (see Fig.6, 7, and 8)

5 1-3-0. Outline

1. A function to specify a time to switch on/off
the display device (large-scale plasma display 3021)
is provided.

2. A function to automatically establish
10 connection with the terminal systems 30 is provided.

1-3-1. Function to Control Switching On/Off of
Terminal Systems 30

1. A setting is made with regard to when the
plasma display 3021 of a given terminal system 30 is
15 switched on and switched off.

(1) The setting is made with respect to each
terminal system 30.

(2) The setting can be made on the spot by
an operator operating the server PC 20.

20 1-3-2. Function to Connect to Terminal Systems 30

1. In order to establish connection with terminal
systems 30,

(1) telephone numbers (an item of the
terminal-attribute information 10c) of the terminal
25 systems 30 are specified; or

1 (2) the terminal systems 30 are specified.

Establishment of connection at the time of
automatic delivery of the advertisement-contents data
10a is automatically performed based on what is
5 specified in the advertisement-delivery-schedule data
10d.

1-4. Function to Set/Control Display-Schedule

Data 10b (see Figs.6, 7, and 8)

1-4-0. Outline

10 1. A display schedule is specified with regard to
which terminal systems 30 display the advertisement-
contents data 10a and what time the contents are
displayed.

1-4-1. Function to Set Display-Schedule Data 10b

15 1. The display-schedule data 10b regarding the
advertisement-contents data 10a is laid out in
preparation for subsequent transmission to the
terminal systems 30.

The settings can be changed/deleted.

20 2. The display-schedule data 10b includes an
identification number of a terminal system 30 (an item
of the terminal-attribute information 10c), a contents
name, a date and time for replay, and a number of
replays.

25 3. It is possible to change/delete the display-

1 schedule data 10b that has been already transmitted.

1-4-2. Function to Retrieve/Display Display-
Schedule Data 10b

1. A search for a display schedule is made by
5 specifying at least a client name, a terminal-system
name, a contents name, or a date of replay, and search
results are displayed.

1-5. Function to Set/Control Advertisement-
Delivery-Schedule Data 10d (see Fig.6, 7, and 8)

10 1-5-0. Outline

A schedule for delivering the advertisement-
contents data 10a from the server PC 20 to a given
terminal system 30 is set as the advertisement-
delivery-schedule data 10d. The advertisement-
15 delivery-schedule data 10d specifies a date and time
at which the advertisement-contents data 10a is
automatically transmitted from the server PC 20 to the
given terminal system 30.

In general, the delivery is made during a
20 time period when the advertisement-contents data 10a
is not being displayed.

1-5-1. Function to Register Advertisement-
Delivery-Schedule Data 10d

1. The advertisement-delivery-schedule data 10d
25 is set. The settings can be changed/deleted.

- 1 2. The advertisement-delivery-schedule data 10d
includes a name of a destination terminal system (an
item of the terminal-attribute information 10c), a
name of the delivered contents, a client name, and a
5 date and time of delivery.
- 1-5-2. Function to Retrieve/Display
Advertisement-Delivery-Schedule Data 10d
1. A search for a delivery schedule is made by
specifying at least a client name, a terminal-system
10 name, a contents name, or a date of replay, and search
results are displayed.
- 1-5-3. Function to Calculate a Time of Delivery
1. Function to Calculate/Display a Time of
Delivery
- 15 (1) A time of delivery (a start time, an end
time, a total time period) can be calculated with
respect to the advertisement-delivery-schedule data
10d for each terminal system 30, and can be displayed.
- (2) A time of delivery can be calculated in
20 advance with respect to each advertisement-contents
data 10a, and can be displayed.
- 1-6. Function to Deliver Data (see Figs.6, 7, and
8)
- 1-6-1. Function to Deliver Advertisement-Contents
25 Data 10a

1 1. The display-schedule data 10b and the
advertisement-contents data 10a are sent to specified
terminal systems 30 according to the delivery schedule
set forth in advertisement-delivery-schedule data 10d.

5 2. Data delivery to the terminal systems 30
includes automatic delivery based on the
advertisement-delivery-schedule data 10d and manual
delivery based on user operations at the server PC.

10 1-7. Maintenance/Control Function (see Figs.6, 7,
and 8)

1-7-0. Outline

This function attends to tasks relating to
recording of a log for the purpose of
maintenance/control of the multi-media-automatic-
15 delivery system 10. Items for checking operations of
the multi-media-automatic-delivery system 10 are
displayed as they become necessary. Warnings are
given as necessary.

1-7-1. Maintenance Function of Server PC 20

20 1. Function to Make Backup Copy

A backup copy of necessary data is created
at constant intervals or at a time specified via user
operation. Such a backup copy includes a copy of
registered data.

25 2. Operations of the server PC 20 are tested, and

1 test results are displayed as messages. A warning is
given when an error is found.

3. Information necessary for maintenance purpose
may be displayed and printed out.

5 Such information include the following.

(1) Name of contents

(2) Type of contents

(3) Time of event

(4) Date and time of recovery from an error

10 (5) Contents of event

(6) Terminal-attribute information 10c

1-7-2. Maintenance Function for Terminal Systems

30 serving as Display

1. Function to Record Log Information

15 A function to receive and record a log of
the terminal systems 30 is provided.

1-7-3. Maintenance Function for Terminal Systems

30 serving to transmit Character Information 10e

1. Information regarding transmission of the

20 character information 10e is recorded/displayed. Such
information includes the following.

(1) Character information 10e

(2) Date and time of exchange of information

(3) Identification number of a source

25 terminal system 30 (an item of the terminal-attribute

1 information 10c)

(4) Identification number of a sender
obtained from the source terminal system 30

1-8. Security Function (see Figs.6, 7, and 8)

5 1-8-0. Outline

1. A function for protecting data from
unauthorized access from within or outside the system
is provided.

1-8-1. Security Function and Access Authorization

10 to access Server PC 20

1. A function is provided to prevent unauthorized
users from accessing or tampering with the server PC.

1-9. Function to Transmit Emergency Character

Information 10e (see Figs.6, 7, and 8)

15 1-9-0. Outline

Character information 10e that is displayed
in an emergency is transmitted from a transmission-
purpose-dedicated terminal system 30 to display-
purpose terminal systems 30 via the server PC 20.

20 The terminal systems 30 displays the
character information 10e only when the server PC 20
can identify the source terminal system 30 and the
operator thereof as a valid system and user.

1-9-1. Identification Function and Transmission

25 Function

1 1. Identification is required when a dedicated
terminal system 30 issues a request for transmission.

 If identification is valid, the character
information 10e is forwarded to the terminal systems
5 30. If identification is invalid, transmission is not
forwarded.

 An appropriate identification system is
selected based on the consideration of its costs and
performances.

10 2. Encoding System (see Figs.6, 7, and 8)

 2-1. Function to Create Advertisement-Contents
Data 10a

 The advertisement-contents data 10a is created by
using a separately provided system.

15 1. Encoding of Image Data

 (1) A required encoding system is used for
encoding MPEG2 data.

 (2) An encoding process is performed based on
encoding parameters specified for MPEG2 and JPEG.

20 3. Operation of Server PC 20 (see Fig.2)

 1. Function to Deliver Advertisement-Contents
Data 10a

 (1) The advertisement-contents data 10a created
by a vendor is stored in memory media of the center
25 system 20.

1 (2) The operator enters the advertisement-
contents data 10a, a display schedule, the
advertisement-delivery-schedule data 10d, and the
terminal-attribute information 10c via the display.

5 (3) The advertisement-contents data 10a and the
display-schedule data 10b are automatically
transmitted to the terminal systems 30 in accordance
with the advertisement-delivery-schedule data 10d.

10 [5] Terminal System 30 (Client PC) (see Figs.6,
7, 9, and 10)

 In the following, a first embodiment of the
terminal systems 30 will be described.

15 [5-1] Outline

A terminal system 30 according to the first
embodiment is used as either a display-purpose
terminal system 30 or a character-information-
transmission-purpose terminal system 30 in the multi-
20 media-automatic-delivery system 10, which has the
following functional features.

[5-1-1] Outline of Functions of Multi-Media-
Automatic-Delivery System 10

(1) Delivery of Advertisement-Contents Data 10a
25 to Terminal Systems 30 via Communication Lines 11 and

1 Automatic Display Function of Terminal Systems 30

The advertisement-contents data 10a is transmitted from the server PC 20 via ISDN lines (64 or 128 Kbps) by taking several times to several tens
5 of times as long as a display time.

The terminal systems 30 accumulate the advertisement-contents data 10a, and display it according to a specified schedule.

(2) Function to Display Character Information 10e
10 at Time of Emergency

The character information 10e is delivered and displayed on the terminal systems 30 so as to present information of an urgent nature at the time of an emergency such as earthquake.

15 [5-1-2] Communication Line 11: ISDN lines 11 (64 kbit/sec or 128 kbit/sec)

[5-1-3] Displayed Contents: moving pictures, still images, and a combination thereof

[5-1-4] Types of Advertisement-Contents Data 10a

20 (1) Moving Pictures

a. MPEG2 data in the range of 6 Mbps is used.

b. It takes one to three minutes to display one set of the advertisement-contents data 10a.

25 c. The number of contents stored in one

1 terminal system 30 is limited to 20 to 50.

(2) Still Images

a. JPEG data with a resolution equivalent to
a VGA level

5 b. No limit to a time period during which
the images are displayed (i.e., the images may be
displayed for only a short period of time or for 24
hours)

[5-1-5] Character Message 10e at Time of

10 Emergency

(1) 5 to 30 characters per message

(2) There are two cases, i.e., the first case in
which the character information 10e is superimposed on
the advertisement-contents data 10a and the second
15 case in which the display of the advertisement-
contents data 10a is suspended so as to present the
character information 10e over the entire screen of
the large-scale plasma display 3021.

(3) The character information 10e requires
20 realtime handling thereof to a certain extent (i.e.,
needs to be displayed a few seconds to a few minutes
aver the delivery thereof).

[5-1-6] Features of Multi-Media-Automatic-
Delivery System 10

25 (1) The terminal systems 30 is provided with a

1 function to display contents according to a specified
schedule.

(2) Operation costs are low. Since the moving-
picture-contents data 10a can be transmitted by taking
5 time during a light-load time period such as a
nighttime, there is no need to use communication lines
11 that offer a high-speed data transfer and a large
capacity at a high cost.

In the following, each function will be
10 further described in detail (see Figs.6, 7, 9, and 10)

1. Display-Purpose Terminal Systems 30

1-1. Displaying of Contents

1-1-0. Basic Function

15 The moving-picture-contents data 10a and the
display-schedule data 10b are received from the server
PC 20, and the moving-picture-contents data 10a is
displayed according to a schedule specified in the
display-schedule data 10b.

20 1-1-1. Function to Receive/Display Data

1. A function is provided to receive and store
the moving-picture-contents data 10a and the display-
schedule data 10b.

Data sent from the server PC 20 is received
25 and stored.

- 1 2. The moving-picture-contents data 10a is
displayed.

According to the received display schedule,
the moving-picture-contents data 10a is displayed.

- 5 3. A mechanism is put in place to cope with a
change in the display-schedule data 10b and the
moving-picture-contents data 10a when the server PC 20
issues a request for a change.

1-1-2. Function to Delete Data

- 10 1. The display-schedule data 10b whose schedule
has been worked through is deleted along with the
moving-picture-contents data 10a.

1-2. Function to Display Emergency Character
Information 10e

- 15 1-2-0. Basic Function

- The character information 10e and the
display-schedule data 10b are received in an emergency
from a dedicated terminal system 30 via the server PC
20, and the character information 10e is displayed
20 according to a schedule specified in the display-
schedule data 10b.

1-2-1. Function to Receive/Display Data

1. Function to receive/store data sent from
server PC 20
25 Data sent from the server PC 20 is received

1 and stored.

2. Display of the moving-picture-contents data
10a

According to the received display schedule,
5 the character information 10e is displayed.

1-2-2. How to Display Character Information 10e

1. A change can be made to the way of presenting
the character information 10e based on an instruction
from the dedicated terminal system 30.

10 There are two ways of presentation.

(1) The character information 10e is
displayed as superimposition on the currently
displayed images.

There is no change to the display-schedule
15 data 10b of the moving-picture-contents data 10a.

(2) Only the character information 10e is
displayed.

If the moving-picture-contents data 10a is
being displayed, displayed contents are erased from
20 the screen for presenting the character information
10e. The canceled contents are not to be presented
retroactively after the end of display of the
character information 10e.

1-3. Maintenance/Control Function of Terminal
25 System 30

1 1-3-0. Basic Function

1. The terminal-attribute information 10c is controlled.

2. A log of the terminal system 30 is recorded
5 for the maintenance/control purposes, and is sent to the server PC 20.

A transmission is made in response to a transmission request from the server PC 20.

Operator operating the terminal system 30
10 can access the data that is used for the maintenance/control purposes.

1-3-1. Function to Control Terminal System 30

1. Function to Register Terminal System 30

The following items are registered through
15 operator operations on the terminal system 30 or through instructions from the sever PC 20.

In addition to registration, a means is provided to add, change, and delete the registered items.

20 (1) Identification number of the terminal system 30 (an item of the terminal-attribute information 10c)

(2) Telephone number (an item of the terminal-attribute information 10c)

25 (3) Installed location (an item of the

1 terminal-attribute information 10c)

(4) Type of display device (i.e., a plasma display 3021, a poster vision, etc.)

(5) Identification number(s) of the other
5 terminal system(s) 30 when a twin or triple configuration is used (an item of the terminal-attribute information 10c)

The identification numbers are uniquely assigned. The contents of the registered items need
10 to maintain consistency between the server PC 20 and the terminal system 30.

1-3-2. Function to Store Log Information and Send same to Server PC 20

1. Timing to Transmit Log Information

15 Log information is recorded regarding all events occurred during operation. Record are such that access can be made to learn about a given event and to find a time of the event, a terminal system 30 suffering the event, the contents, and the client.

20 (1) Error of a terminal system 30

(2) Display status of the character information 10e

In addition to the above, the log is recorded in every manner that keeps a thorough record
25 necessary for maintenance/control of the terminal

1 system 30, and appropriate measures need to be taken.

1-4. Security Function

1-4-0. Basic Function

1. A means is provided to insure security against
5 intruders.

Each of the terminal systems 30 is provided
with an access authorization to access the server PC.

1-4-1. Security Function and Access Authorization
to Access Server PC 20

10 1. Security Against Intrusion and Tampering

This function is provided to prevent
unauthorized users from entering or tampering with the
terminal systems 30 through the network.

An appropriate security measure is taken
15 based on the consideration of costs (development/
operation costs).

2. An access authorization is registered in the
terminal systems 30 with respect to operators of the
terminal systems 30.

20 3. Access Authorization to Access Server PC 20

A terminal system 30 without no access
authorization cannot access the server PC 20.

A mechanism is put in place to allow the
server PC 20 to distinguish authorized terminal
25 systems 30 from unauthorized terminal systems 30.

1 1-5. Other Functions

1-5-0. Basic Function

1. The display device (plasma display 3021) is
switched on/off according to a schedule transmitted
5 from the server PC 20.

1-5-1. Function to Switch On/Off Terminal System
30

1. The display device (plasma display 3021) is
controlled with respect to switching on/off thereof
10 according to the schedule set by the server PC 20 or
according to instructions given manually at the server
PC 20.

2. Function to Create/Transmit Character
Information 10e

15 2-1. Transmission of the Character Information
10e

2-1-0. Basic Functions

1. In emergency, the character information 10e is
sent to the terminal systems 30 via the server PC 20.
20 In doing so, access authorizations of a source
terminal system 30 and an operator thereof are
checked.

The server PC 20 forwards the character
information 10e to the terminal systems 30 only when
25 access authorizations are recognized.

1 2-1-1. Function to Create Character Information

10e

1. The character information 10e includes one
created on the spot via manual entry and one selected
5 from a data set provided in advance.

2. The character information 10e can be
registered/edited/deleted.

The data set provided in advance includes
data generated by a separate system.

10 2-1-2. Function to Create/Display Display-
Schedule data 10b

1. Function to Create the Display-Schedule Data
10b

The display-schedule data 10b includes a
15 display-start time, a display-end time, and an
identification number of a terminal system 30 (an item
of the terminal-attribute information 10c).

The schedule can be registered, edited, and
deleted.

20 2. Function to Set the Way of Displaying on
Monitor

(1) A switch can be made between full-screen
display and superimposition display.

2-1-3. Function to Transmit Data

25 1. A display-purpose terminal system 30 sends to

1 the server PC 20 necessary data for displaying the
character information 10e. Such data includes the
character information 10e, a display schedule,
display-control information, and identification data.

5 2-2. Security Function

2-2-0. Basic Function

A function is provided to insure security
against an intruder from outside or tampering from
inside. Security can also be controlled at
10 transmission sites.

2-2-1. Security Function and Access Authorization
to Access Server PC 20

1. Security Against Intrusion and Tampering

This function is provided to prevent
15 unauthorized users from entering or tampering with the
terminal systems 30 through the network.

An appropriate security measure is taken
based on the consideration of costs (development/
operation costs).

20 2. An access authorization is registered in the
terminal systems 30 with respect to operators of the
terminal systems 30.

3. Access Authorization to Access Server PC 20

A terminal system 30 and an operator thereof
25 without no access authorization cannot access the

1 server PC 20 (a mechanism is put in place to allow the
server PC 20 to distinguish authorized terminal
systems 30 from unauthorized terminal systems 30).

3. Structure of Transmission Data

5 3-1. Data Type

3-1-0. Basic Functions

Specifications regarding data formats of all
data types including attached information and
specifications of interface with the server PC 20 are
10 created.

3-1-1. Advertisement-Contents Data 10a

1. Moving picture (MPEG2), still images (JPEG)
2. Each piece of contents has an identification
number.
- 15 3. A contents name, a client name, a registration
date, a set of target terminal systems 30, and data
types are included as attached information.

3-1-2. Display-Schedule Data 10b of Advertisement-Contents Data 10a

- 20 1. A date and time of a start, a date and time of
an end, and a number of repetitions may be included in
the data structure to insure smooth display of
contents in a specified order.

25 (Second Embodiment)

1 In what follows, a second embodiment of the
multi-media-automatic-delivery system 10 will be
described (see Figs.11, 12, 13, and 14).

 The center system (server PC) 20 has the
5 same configuration as that of the first embodiment,
and a description thereof will be omitted. A
description will be given with regard to the terminal
systems 30.

10 [6] Terminal System 30 (Client PC)

 [6-1] Outline

A system according to this embodiment is used as
a network-delivery display system having the following
features (1) and (2) among other features.

15 (1) Delivery of Multi-Media Data to Terminal
Systems 30 via Communication Lines 11 and Automatic
Display Function of Terminal Systems 30

 The multi-media data is transmitted from the
server PC 20 via ISDN lines (64 or 128 Kbps) by taking
20 several times to several tens of times as long as a
display time.

 The terminal systems 30 accumulate the
moving-picture-contents data 10a, and display it
according to a specified schedule.

25 (2) Function to Display Character Information 10e

1 at Time of Emergency

The character information 10e is displayed
in an emergency such as earthquake.

[6-1-2] Places of Installation of Display

5 Terminal Systems 30 and Number of Installed Systems.

Systems are installed not only indoors but
also outdoors. The number of installed systems may be
about either 10 or 100.

[6-1-3] Communication Line 11: ISDN lines 11 (64
10 kbit/sec or 128 kbit/sec) or PIAFS communication (both
are supported)

[6-1-4] Displayed Contents: moving pictures,
still images, voice, and a combination thereof

[6-1-5] Types of Advertisement-Contents Data 10a
15 (1) Moving Pictures

a. MPEG data in the range of 6 Mbps (one
type of the moving-picture-contents data 10a) is used.

b. It takes one to three minutes to display
one set of the advertisement-contents data 10a.

20 c. The number of contents stored in one
terminal system 30 is limited to 20 to 50.

(2) Still Images

a. JPEG data with a resolution equivalent to
a VGA level

25 b. No limit to a time period during which

1 the images are displayed (i.e., the images may be
displayed for only a short period of time or for 24
hours)

(3) Voice

5 a. An appropriate data format is used.

b. Voice may be provided in combination with
moving pictures and still images, or may be provided
alone.

[6-1-6] Character Message 10e at Time of
10 Emergency

(1) 5 to 30 characters per message

(2) There are two cases, i.e., the first case in
which the character information 10e is superimposed on
the advertisement-contents data 10a and the second
15 case in which the display of the advertisement-
contents data 10a is suspended so as to present the
character information 10e over the entire screen of
the large-scale plasma display 3021.

(3) The character information 10e requires
20 realtime handling thereof to a certain extent (i.e.,
needs to be displayed a few seconds to a few minutes
aver the delivery thereof).

[6-1-7] Features of Multi-Media-Automatic-
Delivery System 10

25 (1) The terminal systems 30 is provided with a

1 function to display contents according to a specified
schedule.

(2) Operation costs are low. Since the moving-
picture-contents data 10a can be transmitted by taking
5 time during a light-load time period such as a
nighttime, there is no need to use communication lines
11 that offer a high-speed data transfer and a large
capacity at a high cost.

[6-2] Others

10 In the following, each function of the
terminal systems 30 according to the second embodiment
will be further described in detail.

1. Functions of Terminal Systems 30

15 1-1. Function to Display Contents

1-1-0. Outline

The moving-picture-contents data 10a and the
display-schedule data 10b are received from the server
PC 20, and the moving-picture-contents data 10a is
20 displayed according to a schedule specified in the
display-schedule data 10b.

1-1-1. Function to Receive/Display Data

1. A function is provided to receive and store
the moving-picture-contents data 10a and the display-
25 schedule data 10b.

1 Data sent from the server PC 20 is received
and stored.

 A data format of the advertisement-contents
data 10a is checked, and the server PC 20 is notified
5 if the check finds abnormality.

2. The moving-picture-contents data 10a is
displayed.

 According to the received display schedule,
the moving-picture-contents data 10a is displayed.
10 3. A mechanism is put in place to cope with a
change in the display-schedule data 10b and the
moving-picture-contents data 10a when the server PC 20
issues a request for a change.

1-1-2. Function to Delete Data

15 1. The display-schedule data 10b whose schedule
has been worked through is deleted along with the
moving-picture-contents data 10a.

1-2. Function to Display Emergency Character
Information 10e

20 1-2-0. Basic Function

 The character information 10e, a display
schedule, and character-display-control information
are received in an emergency from a dedicated terminal
system 30 via the server PC 20, and the character
25 information 10e is displayed according to a schedule

1 specified in the display-schedule data 10b.

1-2-1. Function to Receive/Display Data

1. Function to receive/store data sent from
server PC 20

5 Data sent from the server PC 20 is received
and stored.

2. Display of character moving-picture-contents
data 10a

According to the received display schedule,
10 the character information 10e is displayed.

1-2-2. How to Display Character Information 10e

1. The character information 10e is displayed
according to the character-display-control
information.

15 The character-display-control information
includes the following settings.

(1) Presentation through superimposition on
the currently displayed image

In this case, the display-schedule data 10b
20 of the advertisement-contents data 10a is not changed.

(2) Presentation of characters alone on the
screen

If the moving-picture-contents data 10a is
being displayed, displayed contents are erased from
25 the screen for presenting the character information

1 10e. The canceled contents are not to be presented
retroactively after the end of display of the
character information 10e.

1-3. Maintenance/Control Function of Terminal
5 System 30

1-3-0. Outline

1. The terminal-attribute information 10c is
controlled.
2. A log of the terminal system 30 is recorded
10 for the maintenance/control purposes, and is sent to
the server PC 20.

A transmission is made as a voluntary action
of the terminal system 30, or is made in response to a
transmission request from the server PC 20.

15 3. An automatic diagnosis function and a remote
diagnosis function are provided.

Operator operating the terminal system 30
can access the data that is used for the
maintenance/control purposes.

20 1-3-1. Function to Control Terminal System 30

1. Function to Register Terminal System 30

The following items are registered through
operator operations on the terminal system 30 or
through instructions from the sever PC 20.

25 In addition to registration, a means is

1 provided to add, change, and delete the registered
items.

(1) Identification number of the terminal
system 30 (an item of the terminal-attribute
5 information 10c)

(2) Telephone number (an item of the
terminal-attribute information 10c)

(3) Installed location (an item of the
terminal-attribute information 10c)

10 (4) Type of display device (i.e., a plasma
display 3021, a poster vision, etc.)

(5) Identification number(s) of the other
terminal system(s) 30 when a twin or triple
configuration is used (an item of the terminal-
15 attribute information 10c)

The identification numbers are uniquely
assigned. The contents of the registered items need
to maintain consistency between the server PC 20 and
the terminal system 30.

20 1-3-2. Function to Diagnose System

1. A self-diagnosis function and a remote
diagnosis function are provided.

Self-diagnosis function: an operation test
is automatically conducted by the terminal system 30
25 on its own.

1 Remote-diagnosis function: an operation test
on the terminal system 30 is conducted via remote
control by the server PC 20.

 The following tests are conducted with
5 necessary logs being recorded and results of the tests
being sent to the server PC 20.

 (1) Test on communications with the server
PC 20

 (2) Test on displaying of the advertisement-
10 contents data 10a

 (3) Test on operations of the monitor camera
(the remote diagnosis also includes a test to transmit
a captured picture to the server PC 20)

 (4) Test on displaying of the character
15 information 10e

 (5) Other tests necessary for system
diagnosis

2. A time to conduct a self diagnosis can be
specified by either the terminal system 30 or the
20 server PC 20.

3. The self-diagnosis can also be conducted via
operator operations on the terminal system 30.

1-3-3. Function to Store Log Information and Send
same to Server PC 20

25 1. Timing to Transmit Log Information

1 Log information is recorded regarding all
events occurred during operation and results of the
diagnoses. Record are such that access can be made to
learn about a given event and to find a time of the
5 event, a terminal system 30 suffering the event, the
contents, and the client.

(1) Communication error (transmission upon
error occurrence)

(2) Power failure of the terminal system 30
10 (transmission upon power failure)

(3) Error of the terminal system 30
(transmission upon error occurrence)

(4) Transmission status of emergency
character information 10e (transmission to the server
15 PC 20 everyday at such a time as the display operation
is stopped for the day)

(5) Total time of display operations of the
terminal system 30 (i.e., for the purpose of informing
of a time of device replacement)

20 In addition to the above, the log is
recorded in every manner that keeps a thorough record
necessary for maintenance/control of the terminal
system 30, and appropriate measures need to be taken.

1-3-4. Function to Cope with Power Failure

25 1. Emergency power that is not affected by a

1 power-cut is used as a measure against a power failure.

2. To cope with a situation in which a long power failure incapacitates the emergency power, the
5 terminal system 30 is designed so as to be restarted via remote control from the server PC 20 or via operator operations on the terminal system 30.

1-3-5. Remote Maintenance of Software of Terminal System 30

10 1. Software of the terminal system 30 can be updated, be maintained, be installed, and be modified for changing settings thereof via remote control from the server PC 20.

Note: when commercially-available remote-access
15 software is used, terminal systems 30 for installing software can be specified.

1-4. Security Function

1-4-0. Outline

1. A means is provided to insure security against
20 intruders.

Each of the terminal systems 30 is provided with an access authorization to access the server PC.

1-4-1. Security Function and Access Authorization to Access Server PC 20

25 1. Security Against Intrusion and Tampering

1 This function is provided to prevent
unauthorized users from entering or tampering with the
terminal systems 30 through the network.

 An appropriate security measure is taken
5 based on the consideration of costs (development/
operation costs).

2. An access authorization is registered in the
terminal systems 30 with respect to operators of the
terminal systems 30.

10 3. Access Authorization to Access Server PC 20

 A terminal system 30 without no access
authorization cannot access the server PC 20.

 (A mechanism is put in place to allow the
server PC 20 to distinguish authorized terminal
15 systems 30 from unauthorized terminal systems 30.)

1-5. Other Functions

1-5-0. Outline

1. Synchronization is established between the
server PC 20 and the terminal systems 30.
- 20 2. The display device (plasma display 3021) is
switched on/off according to a schedule transmitted
from the server PC 20.
3. A switch is made from one display device to
another according to an instruction from the server PC
25 20.

- 1 4. The display device is taken a picture of, and
the picture is transmitted to the server PC 20.

1-5-1. Function to Correct Time Setting of
Terminal System 30

- 5 A clock of the multi-media-automatic-
delivery system 10 is adjusted.

1. A time difference between the server PC 20 and
the terminal systems 30: less than ± 5 seconds
2. A time difference between the terminal systems
10 30 forming a twin or triplet configuration: less than
 ± 2 seconds
3. A time difference between the servers (when
there are more than one server PC 20): less than ± 5
seconds

- 15 1-5-2. Function to Switch On/Off Terminal System
30

This function is provided separately for the
terminal system PC and the large-scale plasma display
3021.

- 20 1. The display device is controlled with respect
to switching on/off thereof according to the schedule
set in advance by the server PC 20 or according to
instructions given manually at the server PC 20 on the
spot.
- 25 2. The terminal system PC can be switched on/off

1 through operator operations on the server PC 20.

1-5-3. Switching of Display Device

According to a switch instruction sent from the
server PC 20 or operations entered into the terminal
5 system 30, a choice can be made between a display-
purpose terminal system 30 and a TV monitor.

2. Function to Create/Transmit Emergency

Character Information 10e

2-1. Transmission of the Character Information

10 10e

2-1-0. Outlines

A detailed mechanism of creating/transmitting the
character information 10e is specified in the
specification, and is dependent on the locations where
15 the terminal systems 30 are installed, the number of
terminal systems 30, and the means of communication.

The following items are listed based on an
assumption that a dedicated terminal system 30 is
installed.

20 1. In an emergency, the character information 10e
is sent to the display-purpose terminal systems 30 via
the server PC 20.

In doing so, access authorizations of a
source terminal system 30 and an operator thereof are
25 checked.

1 The server PC 20 forwards the character
information 10e to the display-purpose terminal
systems 30 only when access authorizations are
recognized.

5 2-1-1. Function to Create Character Information
10e

1. The character information 10e includes one
created on the spot via manual entry and one selected
from a data set provided in advance.

10 2. The character information 10e can be
registered/edited/deleted.

The data set provided in advance includes
data generated by a separate system.

2-1-2. Function to Create/Display Display-
15 Schedule data 10b

1. Function to Create the Display-Schedule Data
10b

The display-schedule data 10b includes a
display-start time, a display-end time, and an
20 identification number of a terminal system 30 (an item
of the terminal-attribute information 10c).

The schedule can be registered, edited, and
deleted.

2. Function to Set the Way of Displaying on
25 Monitor

1 (1) A switch can be made between full-screen
display and superimposition display.

 (2) A character size can be chosen.

2-1-3. Function to Transmit Data

5 1. A display-purpose terminal system 30 sends to
the server PC 20 necessary data for displaying the
character information 10e. Such data includes the
character information 10e, a display schedule,
display-control information, and identification data.

10 2-2. Function to Maintain/Control Dedicated
Terminal System 30

2-2-0. Outline

1. The terminal-attribute information 10c is
controlled.

15 2. A necessary diagnosis is given to the multi-
media-automatic-delivery system 1. Function to
provide a diagnosis includes an automatic diagnosis
function and a remote diagnosis function.

2-2-1. Function to Control Terminal System 30

20 1. Function to Control the Terminal-Attribute
Information 10c

 The terminal-attribute information 10c is
registered in order to control the terminal systems
30. In addition to new registration, such functions
25 are provided as to change/delete the registered items.

1 There is a need to insure consistency of the
terminal-attribute information 10c between the server
PC 20 and the terminal systems 30.

2-2-2. System-Diagnosis Function

5 1. An automatic diagnosis function and a remote
diagnosis function are provided.

 (1) Test on communications with the server
PC 20

 (2) Test on data transmission

10 (3) Other system-diagnosis tests which are
deemed necessary

2-3. Security Function

2-3-0. Outline

 A function is provided to insure security
15 against an intruder from outside.

 Identification needs to be recognized by the
server PC 20 when transmitting the character
information 10e.

2-3-1. Security Function and Access Authorization
20 to Access Server PC 20

1. Security Against Intrusion and Tampering

 This function is provided to prevent
unauthorized users from entering or tampering with the
terminal systems 30 through the network.

25 An appropriate security measure is taken

1 based on the consideration of costs (development/
operation costs).

2. An access authorization is registered in the
terminal systems 30 with respect to operators of the
5 terminal systems 30.

3. Access Authorization to Access Server PC 20

A terminal system 30 and an operator thereof
without no access authorization cannot access the
server PC 20. A mechanism is put in place to allow
10 the server PC 20 to distinguish authorized terminal
systems 30 from unauthorized terminal systems 30.

3. Structure of Transmission Data

3-1. Data Type

3-1-0. Outline

15 Specifications regarding data formats of all
data types including attached information and
specifications of interface with the server PC 20 are
created.

3-1-1. Advertisement-Contents Data 10a

20 1. Moving picture (MPEG2), still images (JPEG),
voice

2. Each piece of contents has an identification
number.

3. A contents name, a client name, a registration
25 date, a set of target terminal systems 30, and data

1 types are included as attached information.

3-1-2. Display-Schedule Data 10b of
Advertisement-Contents Data 10a

1. A date and time of a start, a date and time of
5 an end, and a number of repetitions may be included in
the data structure to insure smooth display of
contents in a specified order.

A date and time of a start, a date and time
of an end, a number of repetitions, and the like are
10 specified by the client.

3-1-3. Character Information 10e

1. Each piece of the character information 10e
has an identification number assigned thereto.
2. A date and time of transmission, a date and
15 time of display, and an identification number (an item
of the terminal-attribute information 10c) of the
terminal system 30 are included as attached
information.

As described above, the present invention
20 provides the following advantages. Even when moving-
picture information or high-definition images having a
large amount of multi-media data in the range of
several hundreds mega-bytes is sent from the center
system to the terminal systems for the purpose of
25 delivering commercials on sales goods, notices from a

1 local community, traffic information, a local weather
forecast, or the like, the contents are delivered
during a time period when the communication-line-usage
fee is relatively inexpensive, the purpose being to
5 avoid an increase in a communication-line-usage fee,
caused by use of the communication lines during a
daytime for a long time period for delivering a large
amount of the data. In this manner, the light-load-
time-period-remote-casting function is implemented at
10 a low cost so as to cope with the delivery of multi-
media data such as moving pictures or high-definition
images. Further, even when moving-picture information
or high-definition images having a large amount of
multi-media data in the range of several hundreds
15 mega-bytes is sent from the center system to the
terminal systems for the purpose of delivering
commercials on sales goods, notices from a local
community, traffic information, a local weather
forecast, or the like, the contents are delivered
20 during a time period when the terminal systems are
idling, the purpose being not to require the terminal
systems to have a high-performance capacity and not to
require the communication lines to have a high-speed-
data-transfer capacity so as to avoid a cost increase
25 associated with enhancement of the terminal systems

1 and to avoid an increase in a communication-line-usage
fee caused by use of a high-speed-data-transfer
network. In this manner, the light-load-time-period-
remote-casting function is implemented at a low cost
5 so as to cope with delivery of multi-media data such
as moving pictures or high-definition video images.
Moreover, based on the function to control the
contents-delivery-schedule data, the contents are
changed for each of the terminal systems based on the
10 characteristics of the individual terminal systems so
as to take into account a season, a date, a day,
locations of the terminal systems, etc. Such a
function is implemented as the light-load-time-period-
remote-casting function. As a result, it is possible
15 to eliminate time and labor that would be spent on
recording the contents in recording media such as
magneto-optical memory media or magnetic disks at the
site of the center system. Also, time and labor spent
on the delivery of the recording media to the terminal
20 systems are eliminated. Further, there is no need to
spend time and labor on loading the recording media to
the reading devices of the terminal systems so as to
store the contents in the terminal systems. In this
manner, the light-load-time-period-remote-casting
25 function is implemented so as to eliminate a need for

1 time and labor to be spent on recording of contents in
memory media, delivery of the memory media, and
reading of contents from the memory media. Namely,
the remote-delivery function directed to delivery of
5 high-definition moving pictures (i.e., the light-load-
time-period-remote-casting function) can be achieved
economically by using existing infrastructure, whereas
such a function cannot be implemented in the related-
art schemes which are based on either delivery of
10 recording media or one-way delivery of contents.

Further, the present invention is not
limited to these embodiments, but various variations
and modifications may be made without departing from
the scope of the present invention.

15 The present application is based on Japanese
priority application No.10-033681 filed on January 31,
1998, with Japanese Patent Office, the entire contents
of which are hereby incorporated by reference.

20 The present application is also based on
Japanese priority application No.10-362476 filed on
December 21, 1998, with Japanese Patent Office, the
entire contents of which are hereby incorporated by
reference.